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ABSTRACT

This analysis of employment patterns in the American South extends a 1985 report, "After the Factories: Changing Employment Patterns in the Rural South," which was based on the years between 1977-1982. The 1985 report included Texas, but this analysis includes only the 12 Southern Growth Policies Board (SGPB) member states. This new analysis extends well into the expansion phase of the post-recessionary period and adds per capita income growth and unemployment rates as rough indicators of the quality of growth. Civilian government and corporate support employment have been added to total employment figures to provide a more comprehensive employment measure. The study also looks more closely at the manufacturing and service sectors, and provides a more reliable estimate of the growth of high technology industries. Also considered are local factors suspected of influencing economic growth, particularly those reflecting human resources, including adult literacy, university enrollment, and scientists and technicians, as well as access to interstate highways and the presence of commercial airports. This report finds that employment grew considerably faster in metro counties than in nonmetro counties during the period, but that the average employment growth in nonmetro counties was nearly double the national average. Service and construction industries were behind most new jobs and many of the rural counties experiencing the highest growth rates in manufacturing were geographically remote. After taking inflation into account, however, real per capita income declined in most nonmetro counties. Measures of education and human resources were the most consistent and strongest predictors of growth. The fastest-growing counties generally appear to be located in areas likely to attract tourists or retirees. But the most dramatic success stories resulted from a range of strategies based on local efforts responding to local circumstances and problems. Data is displayed in numerous tables and figures, and appendixes include an outline of industry clasifications, profiles of all 12 SGPB states, various statistical breakdowns on distribution of employment, a list of the top 100 high tech industries, and information on the Enhanced County Business Patterns file. (TES)

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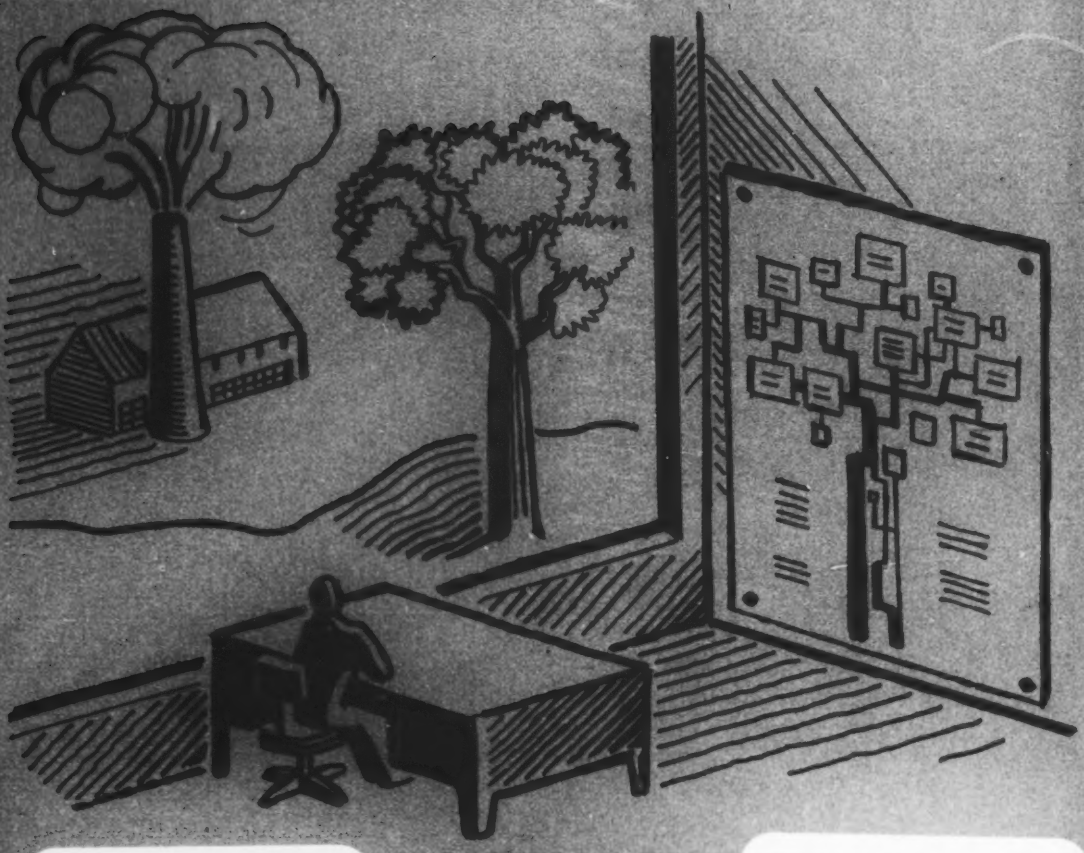
MAKING CONNECTIONS

After the Factories Revisited



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Created by southern governors in 1971, the Southern Growth Policies Board is a unique vehicle for regional cooperation and planning, as well as public-private partnership building. Often referred to as the **"think tank"** for the South on economic development issues, the Board is headquartered in North Carolina's Research Triangle Park.

The Board's credo—***Creating Strategies for Economic Development***—captures the new spirit and direction of the South's efforts to develop its economy and people. The twelve member states and Puerto Rico, who comprise the membership of the Board, have a new dedication to a healthy and sustained growth from within rather than without. This new model of internal economic development focuses on a new set of strategic issues, such as quality education, technology, cutting edge infrastructures, capacity building, and global sophistication. The Board has a regular publications series, conferences, and audio-visual products devoted to these and other development issues.

Each of the twelve states and territory which comprise the Board has five members on the Board of Directors: the governor, a state senator and representative appointed by their respective presiding officers, and two citizen members appointed by the governor. This makes SGPB unique in having gubernatorial, legislative, and private sector membership—a critical combination in creating successful development strategies in today's complex and highly interdependent world. A governor always serves as Chairman, a legislator as Vice Chairman, and a citizen member as Treasurer.

Every six years, the Board assembles a **Commission on the Future of the South** to set forth a statement of regional objectives which will become a policy agenda for the region. The 1986 Commission issued one of the most highly acclaimed reports in the history of the region, *Halfway Home and a Long Way to Go*. In brief, eloquent terms, it lays out ten regional objectives which will form the broad agenda for the Board until 1992. The goal of the report is to improve the economic condition, educational opportunities, and quality of life for all Southerners by increasing their capacity for development from within.

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MAKING CONNECTIONS

After the Factories Revisited

Stuart A. Rosenfeld

Edward M. Bergman

With the assistance of Sarah Rubin

February 1989

Southern Growth Policies Board

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Acknowledgments

The nature of this project, which analyzes data at the county level, required a great deal of accumulating, aggregating, and condensing of information from a variety of sources. The basic data file was created for the original study, *After the Factories*. Data from more recent years were converted into compatible formats and transferred into the files by co-author Dr. Edward Bergman, with the help of University of North Carolina graduate student in City and Regional Planning Shanzi Ke. Mr. Ke also performed many of the statistical analyses.

Finding and entering the supplementary data needed to expand the analysis required a great deal of fairly tedious work. Two graduate students in Duke University's Institute for Policy Sciences and Public Affairs, Stephen E. Field and Cathleen M. Milliken, collected, evaluated, and consolidated data into usable county-level fields. SGPB staff member Gregory Cain also helped update and refine the data file.

Hundreds of analyses were performed on the data base to discover the connections and relationships. Sara Rubin, a consultant from Chapel Hill, working with Kathleen Watters and Stephen Field did much of the "numbers crunching" that was needed to complete the analysis, and Sara did the preliminary analyses.

The chore of preliminary editing of the text and the many tables and figures was undertaken by SGPB Director of Research and Programs Carol Conway and SGPB Research Associate John Hodges-Copple and the later stage editing was done by Anne Lewis of Glen Echo, Maryland and SGPB Associate Director of Communications Robert Donnan. Finally, the momentous task of creating the figures and tables and formatting the final publication fell on Marilee Martin, who is responsible for the design.

And, of course, the project could not have been undertaken without the support and guidance of Susan Sechler and Wendy Cohen of the Rural Economic Policy Program in Washington, D.C.

Stuart Rosenfeld
Deputy Director
Southern Growth Policies Board

Preface

Rarely does the Southern Growth Policies Board engage in primary research. The extraordinary situation facing the rural and small town South in the early 1980s, along with the paucity of documentation on what was actually happening to that economy, led us in 1985 to undertake a major, primary research effort to find some answers. Conceived and supervised by our then Research Director, Dr. Stuart Rosenfeld, the final product, *After the Factories: Employment Patterns in the Non-metropolitan South*, changed the public policy dialogue in the region about economic development.

The original document provided the basis for much of the work of the 1986 Commission on the Future of the South. Its final report, *Halfway Home and a Long Way to Go*, is becoming a blueprint for a new model of southern economic development—one that is far broader than the old model of branch plant recruitment. The new model is more internal and is based on education, technology, quality of life, new infrastructures, and capacity building.

The Board undertook this update of the original study to see if new data shed any new light on our original findings; and, as always, it did. The basic findings of our updated study can be found by reading further; however, nothing in this new study has changed the fundamental implications of the original one: the South needs a new strategy of economic growth which calls for strategic investments in the development of our people so that they can create their own future in both the urban and rural areas of this region.

Jesse L. White, Jr.
Executive Director
Southern Growth Policies Board

Executive Summary

In December 1985, the Southern Growth Policies Board released the report *After The Factories: Changing Employment Patterns in the Rural South (ATF)*. It effectively documented the region's shift away from its traditional industrial development pattern, which for so long favored low-cost rural areas, and the emergence of a new pattern that seemed to favor cities and high-tech areas. The report's principal conclusions were: (1) that the region's economy was indeed undergoing a structural shift—in its mix of industries and its patterns of business locations—from manufacturing to services and from rural to urban; (2) that the infrastructure and institutional arrangements undergirding growth were changing—from exclusive reliance on steel, concrete, and other physical capital for transporting goods to growing reliance on fiber optics, digital switching devices, and human capital for processing and moving information; and (3) that the *quality* of human resources was becoming more important than the *costs* of human resources. On average, the nonmetro parts of the region lagged behind the metro centers. The inference was that the diverging growth patterns were likely to continue because rural counties were not as well prepared to meet the requirements of emerging industries.

In response to the analysis in *After the Factories*, the Southern Growth Policies Board, when it formed its 1986 Commission on the Future of the South, looked hard at the rural economy. The result was an eloquent and persuasive report, *Halfway Home and a Long Way to Go*, which sounded a call for action. In its opening paragraphs, the report states that "the sunshine on the Sunbelt has proved to be a narrow beam of light, brightening futures along the Atlantic Seaboard, and in large cities, but skipping over many small towns and rural areas." The Commission's findings were supported by a battery of background studies, and its recommendations were based in large part on the earlier findings reported in *After the Factories*.

The first widespread policy response from southern states was to reconsider the long-standing economic development policy of industrial recruitment. Recruiting of branch plants, the bread and butter of the rural South's strategy, had long been considered a "buffalo hunt." In the 1980s, however, the number of new branch plants that could be lured to the South was diminishing, and interstate competition was becoming keener.

Developers were advised to turn, instead, to new business start-ups or expansions, and the prevailing economic development catch phrase became "entrepreneurism." They also looked more at opportunities in the rapidly growing service industries. Some indeed took the advice to heart. But many economic development agencies continued to promote plant recruitment, in part because that's what they knew best and in part because there still are enough buffalo out there to justify an effort, particularly with the growing investments from foreign-owned companies. Further, they discovered that entrepreneurial investments are long-term job creation strategies requiring patience. These are less likely to have appreciable and measurable effects on unemployment rates and employment levels over the conventional time frames of their clients in public office.

After the Factories Revisited

There are a number of reasons for re-examining patterns of employment in the South. First, the nation was deep in a recession at the end of 1982; there was uncertainty about whether the findings of *ATF* reflected cyclical or structural changes. The span of years on which *ATF* was based, 1977-1982, ended when the economy was at the bottom of the most recent post-war recessionary trough. Although this bias was acknowledged fully in *ATF*, there was no simple

means of disentangling long-term from purely cyclical declines in that time span. This new analysis extends well into the expansion phase of the post-recessionary period, thereby spanning two comparable points across the nation's business cycles. Second, per capita income growth and unemployment rates have been added as rough indicators of the quality of the growth. Third, additional local factors that are suspected of influencing economic growth—particularly those reflecting measures of human resources—also have been added. These include adult illiteracy, college and university enrollment, technical specialists, and airports.

Fourth, a more comprehensive measure of employment is used. Civilian government and corporate support employment have been included in total employment. The former is an especially important sector in many nonmetro counties and often is used to characterize the nature of some county economies. And last, this study looks more closely at the manufacturing and service sectors and at the interdependencies of factors that influence growth in the "average" county, including a more reliable estimate of high-technology industries. At the same time, attention is focused on some of the outliers—counties that experienced very high growth, unexpectedly high growth, or decline—and the circumstances that may have influenced their performance.

With more recent and additional information, with more time to reflect and reanalyze, and of course, with benefit of hindsight, what now can be said about patterns of employment growth in the rural South?

(Note: the original analysis in After the Factories *included Texas, but this analysis includes only the 12 SGPB member states.* Further, *the total employment has been expanded to include public sector employment. Therefore, the results cannot be compared directly with the previous analysis.)*

The Findings

- Employment grew considerably faster (about 80 percent faster) in metro counties than innonmetro counties throughout the region for the period 1977 -1984.

- Average employment growth in nonmetro counties, while below overall regional growth rate, was nearly double the national average.

- Nonmetro counties have significantly larger shares of the states' populations than they do of jobs, reflecting high levels of commuting between counties.

- Between 1982 and 1984, manufacturing appeared to regain many of the jobs lost in the previous five years, but it failed to contribute significantly to new employment.

- Service and construction industries were responsible for most of the new jobs.

- Many of the rural counties experiencing the highest growth rates in manufacturing jobs were geographically remote and fit the traditional definition of a "good" business climate: low costs, low incomes, low educational levels, and few technicians.

- Unemployment rates remained much higher in nonmetro areas than in metro areas throughout the1977-84 period, on up to the present.

- After taking inflation into account, real per capita income declined in most nonmetro counties.

• Measures of education and human resources were the most consistent and strongest predictors of growth.

• The fastest growth occurred in counties with tourism industries or retirement communities and in those counties able to capture the spillover from metropolitan growth centers.

The Findings: Another Look at Growth Patterns in the Nonmetro South

The differences in average growth rates of southern counties between 1977 and 1984 are not very different from the rates presented in *ATF*. Metro growth exceeded nonmetro growth by nearly 80 percent for the seven-year time span. The pattern, however, is more consistent from state to state than it was from 1977-82. Metro growth rates exceeded nonmetro growth rates in every state.

The first finding, consequently, is that the perception of nonmetro employment stagnation is based more upon the strength of metro growth than on the abject weakness of rural areas. Nonmetro counties in the region on average grew nearly twice as fast as the total metro and nonmetro national average. Nonmetro growth rates in North Carolina, Georgia, and Florida, for example, while well under the total SGPB metro growth rate, were considerably above the regional nonmetro average and the overall national average. Growth trends through 1985, which are calculated for total private, wage, and salary employment show a similar pattern: metro growth exceeds nonmetro growth by 88 percent.

A second important finding is that some modest recovery occurred in the manufacturing sector following the recession (1982-84). This resurgence in nonmetro counties—particularly in Georgia, Mississippi, North Carolina, and Tennessee—cannot be compared, however, to the dynamic industrial growth of past decades; it appears to represent *recovery* rather than net economic expansion. In other words, a recovery from the troughs of the business cycle rather than manufacturing contributing to new growth. Job growth in the manufacturing sector in both metro and nonmetro counties slacked off to about one half of one percent per year, and actually declined in 45 percent of all nonmetro counties. However, manufacturing no longer seems to be migrating from nonmetro to metro sites; from 1982 to 1984, nonmetro counties gained *proportionally* more manufacturing jobs than did metro counties.

The patterns do not signify that manufacturing is no longer important to rural economies, but it does mean that industrial recruitment is unlikely to yield the payoffs in job growth that it attained previously. Recruitment should be used in moderation as an element of a comprehensive development strategy but not as the only or even the dominant strategy.

A third observation is that job growth is not necessarily synonymous with increases in income and prosperity. The per capita income growth (pci) in nonmetro counties did not keep pace with inflation, as measured by changes in the consumer price index. Metro growth in per capita income was 73 percent higher than nonmetro growth, thereby widening disparities between metro and nonmetro incomes. This result supports a finding from the 1988 SGPB report *Reviving the Rural Factory that* industries are still seeking areas with low wages. Further, at the end of 1985, nonmetro unemployment rates stood at 9.7 percent, 55 percent higher than metro rates and substantially more than in 1977. Although they have dropped in recent years, nonmetro unemployment rates remain about 50 percent higher than metro unemployment rates.

The analysis shows that there still are pockets of poverty and slow growth in the South, and conditions in these counties are not improving substantially. In 159 nonmetro counties (or 19 percent of all 816 nonmetro counties) the total employment in 1984 was less than total employment in 1977. In addition and even more distressing, real per capita income is declining in most of those counties. Inflation-adjusted per capita income in 1985 was lower than that in 1981

in 259 nonmetro counties, or nearly one-third of all nonmetro counties. As late as the end of 1987, one in three nonmetro counties in the South still had double digit unemployment rates.

Factors Affecting Growth

As in *After the Factories*, this study attempted to explain the pattern of non-metro job growth. Factors examined included policies on which states commonly spend money, such as interstate highways, colleges, education, and recreation, as well as noncontrollable circumstances such as ruralness, proximity to cities, and the demographic characteristics of the population. This report examines the effects of such factors in a regression model, which reveals the effect that each factor has on employment growth in nonmetro counties.

The same primary classification scheme for counties that was developed for the previous report was used in this report: adjacency or nonadjacency to metropolitan counties and access to interstate highways. The results indicated that growth was slightly influenced by the presence of good interstate highway access, particularly if near a metro area. Growth was also influenced by the presence of commercial airports. Further, jobs are concentrating in metro areas faster than is the population. The existence of more people than jobs in nonmetro counties suggests that many rural workers are drawn by increasingly shorter commutes to expanding metro job pools and by their generally higher wages, while metro workers are drawn to homes in nonmetro counties by lower costs and more livable environments. The latter factor may have helped trigger the rebound that occurred in the construction industries.

The point made most clearly and most forcefully is that education and human resources are the most important factor in economic growth. In every respect, the importance of education is confirmed—levels of education, institutions of higher education, and technical expertise. It strengthens the conviction held in all southern states that growth and education go hand-in-hand in today's economy, and it supports the investments being made in education on economic grounds. The higher the levels of educational attainment in a county, the more likely it added new jobs and raised per capita income.

Technical resources—colleges and universities, scientists and technicians, and technical associate degrees—also influence growth, but the relationship is not quite as clear. Counties with four-year colleges did grow at a greater rate but still well below the metro growth rate. The number of nonmetro counties with universities was quite small, so the differences in growth rates are less meaningful. An unexpected finding was that the number of scientists, engineers, and technicians living in a county had no apparent relationship to overall growth and were negatively associated with changes in manufacturing employment. Manufacturing in the nonmetro South still tends to use conventional production methods, and most plants employ few with technical degrees. Instead, scientists and engineers tend to be highly concentrated at or near research centers and large universities, most of which are in metro centers, or work in information or health-related service industries. Metro counties had proportionally twice as many technical and scientific workers in residence as did nonmetro counties.

Further, manufacturing in metro counties was twice as likely to be categorized as "high tech" as in nonmetro counties, and the relative size of the technical work force was inversely related to manufacturing employment growth. This suggests that manufacturing in the rural South still employs few engineers and technicians on average, and production remains for the most part labor-intensive rather than capital-intensive. In contrast, the proportion of technically trained workers in a county was associated with growth in service industries. While the relative size of the technical labor pool in a county may not influence total growth rates, it is associated strongly with higher and faster growth in per capita income. An explanation may be that the technical

specialists commute to metro jobs, while their higher incomes are credited to the nonmetro county of their residence.

Among the demographic factors, the "ruralness" of the county had no affect on job growth. This measure did affect per capita income; people in more rural counties had lower incomes. However, the concentration of minority populations did influence job growth. Development officials know that businesses avoid counties with large percentages of black populations, and, in fact, counties that were more than one-half black grew very slowly. Moreover, the relationships between race and both per capita income and changes in per capita income were even stronger. Real *and* nominal average per capita income of the 80 counties that were one-half or more black actually was lower in 1985 than in 1981, which may help explain why 42 percent of all rural blacks lived below the poverty line in 1986. Even high levels of educational attainment failed to stimulate high growth in predominantly minority counties.

Conditions that attract tourists and retirees are among the strongest indicators of growth. Jobs in the service industries that generally are associated with tourism are associated with high overall growth—either because they stimulate growth or reflect growing prosperity. Although tourism-related industries often pay low wages, counties with large or fast growing tourism industries were among the fastest growing in per capita income.

A closer look at some of the southern counties—those that have outperformed the region's rural economy, those that have fallen much farther behind, and those that have beaten the odds and done better than expected based on the relationships revealed in the study—can shed additional light on the ingredients of growth. The most striking characteristic of the fastest growing counties is that a large proportion are located in an area likely to attract tourists or retirees: along the coast, in the mountains, or very near other recreational areas. The elderly population constitutes a major economic resource for the South. Nonmetro counties are looking for ways to attract retired people, many of whom have sizable savings and income to spend and invest. The other most important factor favors counties positioned to acquire the spillover from burgeoning metro centers. Many of the fastest growing counties are adjacent to large growth centers and are able to attract residents and the services they require by offering lower costs and less congestion.

The characteristics of counties that grew the fastest in manufacturing employment, somewhat surprisingly, fit the traditional mold of low taxes, low income (and thus probably wages) and low educational levels. This indicates residual effects of either expansions of the remaining low-wage industries that have a market niche or the recovery of nondurables with the weaker dollar. It also is likely that these phenomena are short-lived. Many of the high-growth counties are relatively small and remote. Increases in a small base may not reflect the emergence of new high-growth industries which more often occurs in larger, more diversified economies.

The analyses make it clear that there are common, underlying prerequisites for growth, the most important of which is education. But the most dramatic success stories, the highest growths, resulted from a range of strategies based on lo*cal* efforts and responding to *local* circumstances and opportunities. The most effective state policies are those that enable counties to discover their own strengths, design their futures, and develop strategic plans. For that, they need sufficient and timely information and help with the process.

It is also clear that the links between metro and nonmetro will grow increasingly strong. Even beyond the trend evident in this study of increased commuting lie the trends identified in other works of the Board as well as the 1986 Commission on the Future of the South, that the economic boundaries between local governments are fast outgrowing traditional political divisions. States can assist by facilitating and encouraging inter-local cooperation.

And, finally, the discovery that, in some nonmetro counties, manufacturing jobs rose between 1982-84 does not validate the past narrow focus on recruitment of low-wage industries. Without parallel efforts to diversify the economic base, low-wage jobs remain at risk and most certainly do not add towards rural wealth creation, state and local revenues, or personal savings, and, thus, reduced dependency on state and federal economic development and welfare programs.

The risk we run nowadays
is that of having our minds buried
beneath a dead-weight of information
which we have no inner energy,
no power of reflection,
to appropriate to our own uses
and convert into vital nutriment.
We need to be on our guard against
allowing the mere collector of information
to gain an undue advantage over the man
who would maintain some balance
between his knowledge and reflection.

—Irving Babbitt
"The Rational Study of the Classics"
Atlantic Monthly, March 1897

Introduction

In December 1985, the Southern Growth Policies Board released the report *After The Factories: Changing Employment Patterns in the Rural South* (*SGPB*). The report represented a demarcation between the region's traditional industrial development patterns of the past that favored low-cost rural areas and emerging patterns that seemed to be favoring cities and high-tech areas. It traced changes in employment in the nonmetro counties of the South between 1977-1982 and compared them to changes in metro counties as well as to each other in order to learn how various physical, social, and economic characteristics affect growth patterns. Proximity to metro centers, access to interstate highways, industrial composition, and economic and demographic conditions were examined as possible influences.

The principal conclusions of the report were that the region's economy was, indeed, undergoing a structural shift in its mix of industries and in the patterns of business locations, from manufacturing to services and from rural to urban; that the infrastructure and institutional arrangements undergirding growth are changing, from exclusive reliance on steel, concrete, and other physical capital for transporting goods to growing reliance on fiber optics, digital switching devices, and human capital for processing and moving information; and that the quality of human resources is becoming more important than the costs of human resources. The nonmetro parts of the region, on average, lagged behind the metro centers, and the inference drawn was that diverging growth patterns were likely to continue. Rural counties simply were not as well prepared to meet the requirements of emerging industries.

The fact that the country was in a recession at the end of 1982 left unanswered the question of whether the findings of *After the Factories (ATF)* reflected cyclical events or structural changes open to challenge. It has been two and one-half years since the release of the report, and the economy of the U. S. is now in a period of growth. Have updated and additional information, more time to reflect and reanalyze, and, of course, benefit of hindsight, altered predicted patterns of and beliefs about growth in the rural South? Have the clouds that gathered over the region between 1977-1982 broken up or were they just an illusion to begin with?

This study extends and expands the previous analysis by examining employment growth into the post-recessionary period, adds per capita income growth as an additional indicator of growth, and looks at the effects of other local factors widely suspected of influencing economic growth.

Background

After the Factories, supported by the Ford Foundation and the Southern Rural Development Center, vividly described changes in the region's rural economy—changes that might have been anticipated had they not been preceded by vigorous growth during the 1960s and 1970s and overshadowed by the greater scale of layoffs in America's northern industrial cities. Its central findings documented the emergence of two Souths, a prospering, metropolitan economy and a still-growing but slipping rural economy. This dichotomy marked a clear and unexpected departure from the patterns of the 1960s and 1970s when rural industrial growth raised employment levels and income in the rural South and thus in the region.

The report captured the attention of public policymakers in the South and throughout the nation. The *New York Times*, the *Wall Street Journal*, and virtually every other major newspaper in the eastern half of the nation reported the growing disparities between the rural and ur-

ban South and the growing despair in many parts of the rural South. One *Washington Post* front page headline declared the South to be "A Region Both Thriving and Dying."[1]

These revised projections for the South's economy came as a shock to many southern policymakers. Until the report was released, their energies and resources had been focused on further stimulating the economic potential of southern cities and finding ways to reduce the persistent poverty of rural counties that had not yet entered the new industrial age. Nonmetro and metro indicators of social and economic well-being had been converging for decades, and the future looked even rosier. The analysis in *ATF* found, however, that, lo and behold, the nonmetro South no longer was growing as easily and ubiquitously as in the past. It was southern cities that were taking off.

Employment in the rural South was still growing on average—in fact faster than in many other regions of the country—but the slippage and the emerging patterns of weakness were particularly distressing because they suggested that the states' primary strategy to promote rural development—industrial recruitment—was no longer working. As the economy shifts from goods to information, the counties of the rural South are left with overinvestment in physical capital but underinvestment in human capital, and local economies are not sufficiently diversified to sustain new growth once a major employer leaves.

The people who live in the rural South may have been less surprised by all of these findings and the attention they brought than policymakers or the public at large. Although the rural South had attracted large numbers of new jobs, many of them were at such low wages that the region remained mired in poverty. Public policies and programs had helped to raise the level of economic conditions in the region, but it was a slow process, and the rural South had never quite caught up with the urban South or other rural regions.

One common measure—unemployment rates—depicted a disturbing trend not only in the South but nationally. In 1979, United States nonmetro unemployment rates were on average seven percent higher than metro rates. In 1982, at the peak of the recession, they were 20 percent higher. At the end of 1984, after the economy had rebounded, nonmetro rates—though now lower—remained higher than metro rates by 30 percent. And by 1987, unemployment rates in nonmetro counties had risen to a rate 40 percent higher than in nonmetro counties.[2]

SGPB states show a similar pattern, though it moderated somewhat in 1987. In 1980, the ratio of nonmetro to metro unemployment rates was 1.29. In 1982, it was 1.36, in 1985 it was 1.56, but in 1987 it dropped slightly to 1.48.

The Region's Response

In January 1986, the SGPB co-sponsored a conference with the Southern Rural Development Center (SRDC) to present the findings from *ATF* to southern policymakers and initiate a discussion about solutions. SRDC subsequently documented the conference proceedings in their publication, *Emerging Issues in the Rural Economy of the South.* A short time later, MDC, Inc. released their widely heralded report, *Shadows in the Sunbelt*, also supported by the Ford Foundation, which accentuated the issues and drew considerable media attention to the rural South. The first reaction to the reports was a series of conferences and workshops—on statewide, regional and national levels—that examined the consequences of allowing the emerging metro/nonmetro divergence to continue and that offered options for courses of action.

In late 1986, the SGPB's 1986 Commission on the Future of the South issued an eloquent report, *Halfway Home and a Long Way to Go*, which urged immediate efforts. The report states in the opening paragraphs that "the sunshine on the Sunbelt has proved to be a narrow beam of light, brightening futures along the Atlantic Seaboard, and in large cities, but skipping

over many small towns and rural areas."[3] The Commission's work was supported by a battery of background studies, and its recommendations were influenced by the patterns reported in *ATF*.

In addition to its findings, repeated in *Shadows* and numerous articles, *ATF* stimulated the work of other academics and policy analysts who wished to examine selected topics in greater detail using data files supplied by the SGPB.[4] A few months later, the SRDC along with Georgia's Cooperative Extension Service held a regional conference to present commissioned papers that addressed the issues. It resulted in the publication of *The Rural South in Crisis: Challenge for the Future*;[5] and kept the issues on the front burner. By the mid-1980s, agriculture was in decline and the rural employment woes of the South were spreading to other regions. The National Governors' Association published *A Brighter Future for Rural America?: Strategies for States*,[6] which applied some of the analyses of *ATF* to a group of farm belt states, comparing and contrasting them to the patterns in the southern states.

Numerous other state and local discussions of rural economic development ensued. Together, the documentation of employment patterns in *ATF*, the vivid portrayal by MDC, Inc. in *Shadows*, and widespread press coverage led state development agencies to rethink their rural policies.

The reports also reawakened the largely quiet rural development advocates and stimulated interest in mechanisms that had become dormant when federal support decreased. Rural development initiatives within the United States Department of Agriculture (USDA) had been curtailed after the heady days of the 1970s, and many rural advocacy groups floundered for lack of support. The National Rural Center had just closed its doors, and Rural America was reduced to a selective few projects. But even in better days, national rural concerns were driven by agriculture, not the industrial restructuring depicted in *ATF*. Although poverty in the rural South was addressed, development problems in the South, which was no longer an agricultural economy, were not anticipated. In fact, the industrial jobs that poured into the South were still believed to represent a potential development model for other parts of rural America.

The first widespread policy response from southern states was a repudiation of industrial recruitment as the primary development strategy—in policy if not quite yet in practice. Recruitment of branch plants, the bread and butter of the rural South's strategy, was now described in the terms used in *Shadows in the Sunbelt*—as the waning of the "buffalo hunt." The number of new branch plants was diminishing, and competition was becoming keener.

Developers were advised to turn, instead, to new business start-ups or expansions, and the economic development catch phrase became "entrepreneurism." They were told of greater opportunities in the more rapidly growing service industries. Some took the advice to heart. But many economic development agencies continued to promote plant recruitment, in part because that's what they knew best and in part because there still are enough "buffalo" out there to justify an effort, particularly with the growing investments from foreign-owned companies. Further, they discovered that entrepreneurial investments are long-term job creation strategies requiring patience. Such strategies are less likely to make an appreciable and measurable dent on unemployment rates and new job growth over the conventional time frames of their clients in public office.

The accumulating information also led to a number of new and innovative state policies and programs in the South intended to stimulate new growth in rural counties. The North Carolina legislature established and funded a Rural Development Center; the Georgia legislature enacted the Rural Economic Development Law providing for a program aimed at rural areas, and it established an Office of Rural Development; Arkansas enacted legislation directing the Arkansas Industrial Development Commission to coordinate rural development and is in the process of creating a state-wide rural development bank; and South Carolina created a new position in the Department of Economic Development, assistant to the director for rural eco-

nomic development, to address rural needs as well as a number of new initiatives aimed at workplace literacy and rural leadership. In 1988 the Mississippi legislature passed the Rural Economic Development Finance Act, consisting of $20 million in bonding authority for rural areas and small businesses.[7] Also in 1988, Oklahoma's strategic plan for the next five years included comprehensive strategies to achieve its goal to "assist rural areas to develop viable economies."[8]

Fortunately, policymakers realized quickly that the nation cannot become totally a service economy and that a solid manufacturing base, even if it employs fewer people, is critical. Just as developers began to respond to the hum of the video display unit rather than the whirr of the cutting machine, *Manufacturing Matters*[9] and a series of similar reports documented the inter-dependence of manufacturing production and product development in conjunction with business service industries.

The latest spate of state policies are aimed at improving the competitiveness of existing goods-producing industries, mostly through the use of new technologies and more innovative management methods. Industrial extensions and liaisons and the Southern Technology Council's Consortium for Manufacturing Competitiveness (comprising community and technical colleges) are examples of new state initiatives. Some local development agencies are moving into technology diffusion as well.

The report also led to action at the federal level. A coalition of organizations interested in rural development of the South, led by MDC, Inc. and the Ford Foundation, took the issues to Congress and to the presidential candidates. The Sunbelt Institute brought together southern members of Congress in 1988 to present them with ideas for federal policies that would boost those parts of the rural South in decline and raise income levels.

Why Repeat the Analysis?

Perhaps the most important reason for re-examining employment patterns is that the span of years on which *ATF* was based, 1977-1982, coincided with the nation's most recent recessionary trough. The time frame was constrained by the availability of county level data, disaggregated by industrial sector. Although the bias was acknowledged fully in *ATF*, there could be no simple means of disentangling structural from purely cyclical declines in that time span. In short, some of the disadvantages attributed to nonmetro areas could be judged simply as evidence of a recessionary bias which penalized nonmetro areas disproportionately. Would the rural picture then look brighter when the dollar dropped in foreign trade, the recession ebbed, and the effect of the nation's business cycle was minimized? Were the employment patterns observed earlier a temporary phenomenon or a harbinger of the future?

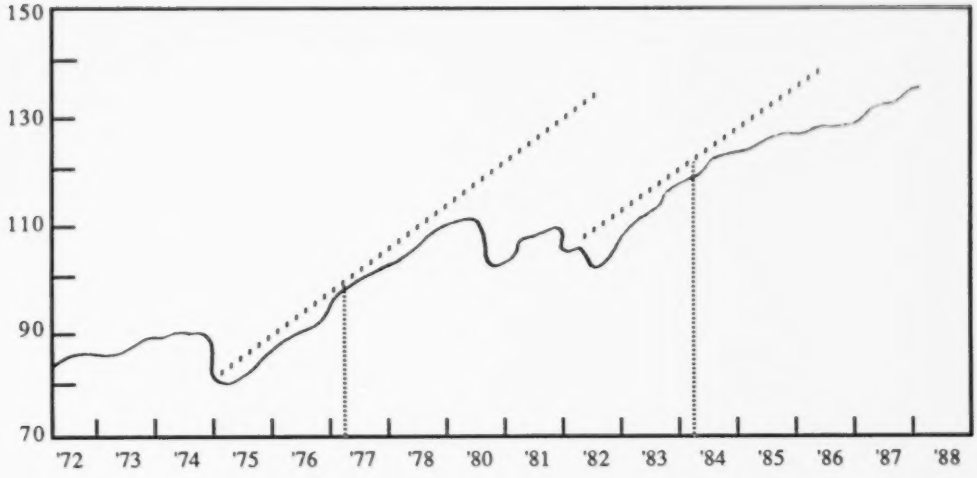
To remove the cyclical effects from this analysis of employment growth, this report first selected 1977-1984 as the period of observation. Note that in *Figure 1-1*, the slopes of the industrial production growth curve are virtually identical at the first quarter of both years when the County Business Data are collected. This means that the measurements are more likely to reflect true growth trends, not oscillating rates of change internal to either of the recessionary troughs spanned by the seven-year period.

Second, the report also relied upon 1980 classifications of metropolitan counties which, by omitting growing counties that later entered the metropolitan system, could have attributed undue growth to nonmetro regions. Other coding and classification anomalies in the nonmetropolitan counties were also discovered in the system devised within the USDA. The net effect of these two biases is to some degree offsetting on the whole, but improved data and corrected classifications would surely lead to greater confidence on other specific points as well.

Third, not all sectors were portrayed. Government employment is omitted in County Business Pattern data and thus was not included in the previous analysis. It is, however, an ex-

Figure I-1

Industrial Production in the U.S. 1972-1988



1977= 100, seasonally adjusted

Source: Federal Reserve Bank of Cleveland: *Economic Trends,* June 1988, p. 4.

ceptionally important sector in many nonmetro counties, even used to characterize the nature of some county economies. Missing also was a reliable estimate of high technology industries. *ATF* used a rough approximation of "new technology" industries, but these were measured imperfectly at best with the two-digit Standard Industrial Code (SIC) detail available in the data.

Fourth, the quality of the changes in employment was not taken into account in any way. Thus, there was no way to discriminate among quality of the growth as measured by changes in unemployment rates, mobility, or per capita income. In this analysis, changes in per capita income and unemployment rates are considered. The years for which the former are compared are 1981 and 1985, admittedly not the same as comparisons on employment changes. Yet, because one would expect a delayed effect on income, they provide evidence of how job growth affected income growth.

These difficulties alone were probably sufficient to justify a recalculation of growth rates with similar but more recent data and to update *ATF* if results were sufficiently different from original findings. However, other matters of importance suggested the need for expansion and refinement of the *ATF* approach as well as an update.

Stimulated by *ATF* and its conceptual viewpoints, other studies examined post-1982 data that indicated renewed vigor in *selected* southern, nonmetro economies. Analyses by Robert Gilmer and Allen Pulsipher found that between 1982 and 1985 rural manufacturing in the TVA region recovered much of the employment it had lost in the previous three years.[10] Analyses by Tom Till supported this for a larger region of the South. Although recovery is not the same thing as net job growth, these and other analyses gave rise to some skepticism concerning the structural nature of the changes and suggested a need for more state-specific findings. That particularly was evident as states promoted new rural development programs.

Further, the salience of using local infrastructures and special categories of human resources as important development stimulants is clearer, as they seemingly affect business start-up, location, and expansion decisions. Thus, revised indicators of business climate and economic capacity give greater emphasis to, for example, education, post-secondary training, institutions of higher education, scientists and research and development, and airports. The added indicators of human resources and infrastructures sharpen the differences between metro and nonmetro counties. Differences in adult functional literacy rates, concentration of technically trained and educated workers, and access to airports and universities are considerable. This analysis attempts to answer the question of just how important they are to growth.

And last, this study looks more closely at the distinctions between manufacturing and services and at the interdependencies among the factors suspected of influencing growth. With the use of multiple regression analysis, independent effects of the many previous and new factors discussed earlier can be determined.

In short, this report broadens the original analysis along several lines that ought to provide new insights into the rural development prospects of the SGPB region. Accordingly, it cannot be compared simply to the previous report for reasons pointed out earlier, but most importantly because in contrast to the earlier analysis, the state of Texas is excluded and government employment is included. To make general comparisons possible, however, some of the 1977-1982 analysis is repeated under the conditions of this report.

The most recently available data invariably are dated by lags in collection, and this report is no exception. The 1984 county level data were the most recently available in the form needed for full analysis. However, some indication of more recent patterns can be observed by using 1986 manufacturing and total employment totals from the recently released 1986 County Business Patterns (and thus without government employment). But as stated earlier, the 1977 and 1984 data roughly coincide with comparable points on the business cycle, and therefore present a less-biased picture and predictor of patterns in the rural South. One final cautionary note: due to the confidentiality of business information, employment data for some industry clusters in many of the small counties is estimated from U.S. Department of Commerce County Business Pattern data by a procedure described in Appendix H. This, however, ought not to affect the averages presented in this report. It is, however, part of the reason that more recent data could not be analyzed.

The Format for Analysis

The basic structure for the analysis, the classifications of county locations, and industry clusters, are similar to that used in *ATF*. Each nonmetro county is categorized according to its adjacency to a metro county and access to an interstate highway in 1984. Most of the categories, which are shown in *Figure I-2*, are self-explanatory, with the exception of the *tier* counties. These counties either are adjacent to a county with an interstate or are intersected by an interstate but do not meet the requirements of a *corridor* county, one having three access points or an access within 20 miles of the population center of the county.

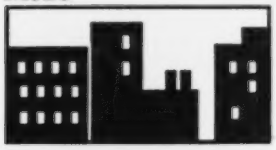
The classifications called industry clusters are functional groupings of the industries from the perspective of economic development. They are composed of the two-digit level of the Department of Commerce's Standard Industrial Code (SIC), shown in Appendix A. For instance, the traditional manufacturing categories sometimes referred to as "sunset industries" are the older southern industries that have been declining. The emerging manufacturing industries are the newer, growth industries sometimes called "sunrise industries." These distinctions are used to divide durable and nondurable manufacturing into the four clusters. Producer services are those industries that generally support and are linked to other industries. Consumer services

Figure I-2

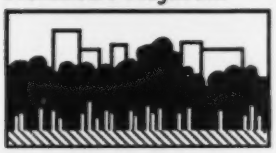
County Locations

Metro-Nonmetro Spectrum

Metro



Nonmetro Adjacent



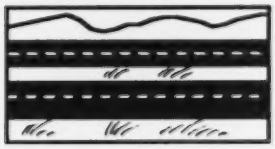
Nonmetro Remote

Interstate Highway Spectrum

Nonmetro Adj./Corridor

Nonmetro Corridor

Nonmetro Tier



are retail and trade industries that generally serve local markets, and urban services are the specialized utilities, transportation, and insurance industries that generally require an urban infrastructure. Government services include all civilian local, state, and federal government employment.

Growth in the Nonmetro South Revisited

The differences in rates of growth of southern counties are not very different from rates of growth presented in *ATF* between 1977-1984. Metro growth exceeded nonmetro growth by 78 percent. That relationship was more consistent than in the previous analysis, with metro growth exceeding nonmetro growth in every state, shown in *Figure I-3* (see page 8). Between 1977-1982, nonmetro counties were still growing faster than metro counties in five of the 12 states. That was no longer true by 1984. The perception of nonmetro stagnation, however, is very much a function of burgeoning metro economies. Nonmetro counties in the South, on average, grew nearly twice as fast as the national average from 1977 to 1984. Nonmetro growth rates in North Carolina, Georgia, and Florida, for example, although well under metro growth rates, were considerably higher than the regional nonmetro average and the overall national average.

Growth trends through 1986, which are calculated for total private, wage, and salary employment excluding government, show a similar pattern: metro growth exceeds nonmetro growth by 88 percent, shown in *Figure I-4* (see page 9).

A second important finding is that in the period immediately following the recession (1982-84), manufacturing recovered in nonmetro counties while losing net jobs in metro areas. The rural recovery was particularly evident in Georgia, Mississippi, North Carolina, and Tennessee, shown in *Figure I-5* (see page 9). But the new manufacturing industries did not generate enough new jobs themselves to drive growth as they had in the past. In effect, some of the manufacturing production lost during the 1977-1982 period resumed, but it did not constitute much new growth. ***In 1984, in about 45 percent of all nonmetro counties, fewer people were employed in manufacturing than had been in 1977.*** Most of the new nonmetro jobs have come from the service and construction sectors; the employment mix is slowly but steadily changing to reflect that pattern. In 1984, trade and services accounted for more than one of every two metro jobs and three of every eight nonmetro jobs. Manufacturing had fallen to a 30 percent share of nonmetro, non-farming jobs. Employment in the manufacturing sector declined in 45 percent of all nonmetro counties.

Further, the rural industrial recovery seemed to have been short-lived. From 1984 to 1986, manufacturing revived in the metro South while dropping back to a growth rate of less than one-half percent per year in the nonmetro South, as shown in *Figure I-6* (see page 10). Only the strong performance of Virginia's rural areas raised manufacturing to growth at all. Without the state of Virginia, SGPB nonmetro counties lost net employment at a rate of 0.04 percent per annum. Nearly half of the SGPB nonmetro counties and half of the states had fewer

Figure I-3

Annual Employment Growth Rates, Metro and Nonmetro Counties 1977-84

Figure I-4

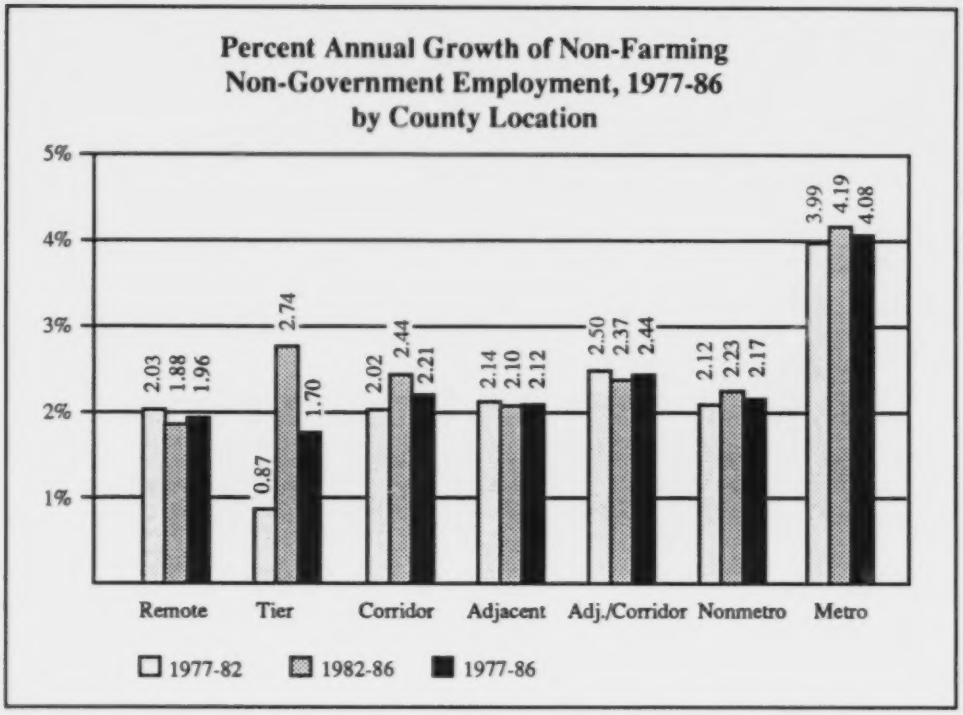
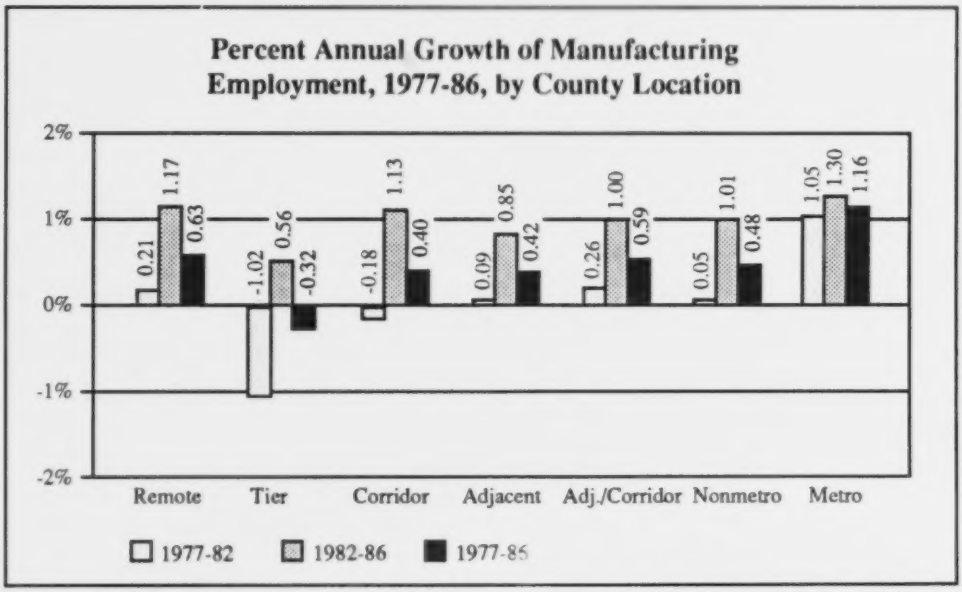


Figure I-5

Figure I-6



jobs in manufacturing in 1986 than they did in 1984 (see *Table I-1*). Thus, the trends noted in *ATF* do indeed appear to be the result of a restructuring that very likely will continue without some dramatic intervention or shift in economic conditions.

A third observation is that growth of jobs is not necessarily synonymous with increasing income or prosperity. The per capita income (PCI) growth in nonmetro counties has not kept pace with increases in inflation, as measured by changes in the consumer price index between 1981-1985, shown in *Figure I-7*. Metro growth in PCI was 73 percent higher than nonmetro growth, thereby widening disparities between metro and nonmetro incomes. This result supports a finding from the 1988 SGPB report *Reviving the Rural Factory* that industries are still seeking areas with low wages.

Lastly, large disparities in average social and economic conditions between nonmetro and metro counties, some of which affect and some of which are effects of growth patterns, remain. Metro and nonmetro data, discussed in more depth in Chapter III, are summarized for the region in *Table I-2* (see page 12) and shown by state in Appendix B. Further, hidden within the nonmetro averages are many pockets of extreme poverty, slow growth, and unemployment, where conditions are at best not improving substantially and at worse, deteriorating. *In 159 nonmetro counties, or 19 percent of the total, the total employment in 1984 was less than total employment in 1977.* In addition, and even more distressing, income is declining in many of those counties. *Per capita income in 1985 was lower than per capita income in 1981 in 259 nonmetro counties, which represents nearly one third of all nonmetro counties.* Further, at the end of 1985, unemployment rates stood at 9.7 percent, 55 percent higher in nonmetro counties than the metro rates and significantly more than in 1977, and 45 percent of all nonmetro counties had double-digit unemployment rates. Although they have dropped in recent years, nonmetro unemployment rates remained about 50 percent higher than those in metro counties at the close of 1987, and 32 percent of all nonmetro counties still had double-digit unemployment rates.

Table I-1

Profile: SGPB States

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	17.64	31.99
Four years of High School, % of Adults	64.73	48.62
Four years of College, % of Adults	16.55	9.44
Technical Work Force, % of Total Labor Force	3.19	1.61
Population and Income		
Percent of State Population, 1985	65.3	34.7
Population Annual Growth Rate, 1980-1985	2.01	0.93
Blacks, % of Total Population	19.62	20.77
Per Capita Income, 1985	$10,849	$7832
PCI Annual Growth Rate, 1981-85	4.49	2.59
Economy		
Percent of Total Employment, 1984	27.70	72.30
Manufacturing, % of Total Employment, 1984	16.16	31.37
High-Tech Manufacturing, % of Manufacturing, 1982	27.29	15.53
Tourism, % of Total Employment, 1984	10.95	6.59
Unemployment Rate, 1985	6.27	9.70

Figure I-7

Annual Growth of Per Capita Income, Metro and Nonmetro Counties 1981-85

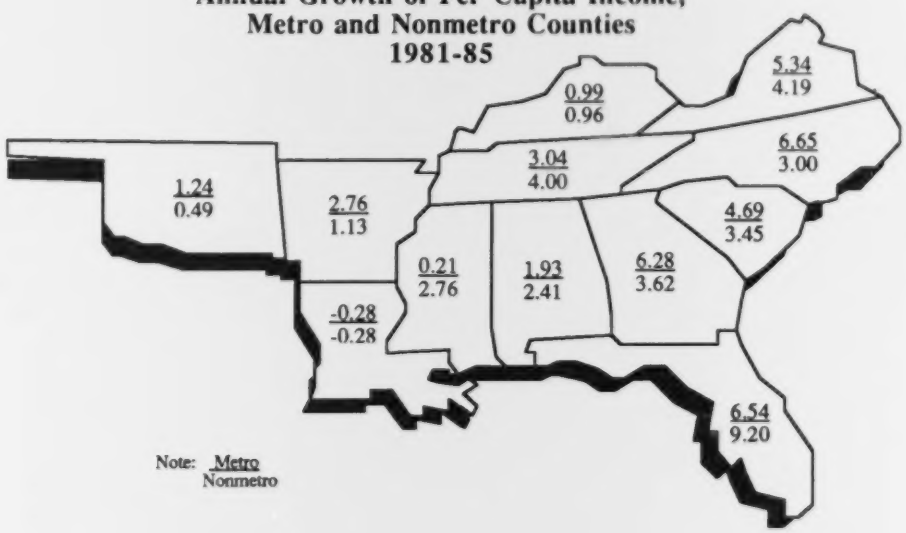


Table I-2

Annual Growth Rate of Employment in Manufacturing by State, Metro/Nonmetro

State	1977-82	1982-84	1984-86	1977-86
Alabama	-107 / 0.48	-1.84 / 2.84	2.57 / -0.39	-0.44 / 0.81
Arkansas	-1.43 / 0.30	1.35 / 2.99	2.11 / 0.15	-0.04 / 0.85
Florida	4.89 / 0.87	2.15 / 2.90	2.82 / 2.10	3.81 / 1.59
Georgia	1.12 / 0.69	2.05 / 3.61	8.95 / 0.67	3.02 / 1.32
Kentucky	-2.33 / -1.41	-2.66 / 2.10	4.42 / 2.14	-0.99 / 0.14
Louisiana	1.60 / 1.53	-8.64 / -7.19	-3.88 / -2.81	-1.98 / -1.44
Mississippi	-2.58 / -0.90	-4.97 / 3.21	4.05 / 0.94	-1.69 / 0.41
North Carolina	1.45 / 0.51	1.64 / 3.05	2.15 / -1.35	1.65 / 0.65
Oklahoma	4.49 / 1.46	-6.54 / -4.40	2.79 / -3.82	1.56 / -1.05
South Carolina	-0.06 / 0.24	-0.77 / 0.85	0.70 / -2.85	-0.05 / 0.32
Tennessee	-0.66 / -0.98	0.10 / 3.59	1.92 / -0.23	0.08 / 0.19
Virginia	0.02 / -0.51	-1.72 / -5.69	5.69 / 10.37	1.20 / 0.61
SGPB	1.05 / 0.05	-0.46 / 1.57	3.09 / 0.45	1.16 / 0.48

The remainder of this report examines various components of and factors affecting growth in more detail. Chapter II looks at the effects of various components of physical infrastructures and at total growth with respect to industrial mix. Chapter III explores the impacts of demographic and environmental factors on job and income growth rates. Chapter IV focuses on educational and technological factors and their relationships to growth rates. Chapter V examines in more detail those counties that experienced particularly fast or slow growth of total jobs, those growing rapidly in manufacturing employment, and those that are growing much more than predicted by the model. Finally, the final chapter presents an overview and a discussion of the most important findings.

Chapter Notes

[1] Peterson and Paul Taylor, "A Region Both Thriving and Dying," *The Washington Post*, 109 (May 19, 1986).

[2] Numbers provided by Kenneth Deaver, Director of the Agriculture and Rural Economy Division of the U.S. Department of Agriculture, 1988.

[3] 1986 Commission on the Future of the South, *Halfway Home and a Long Way to Go* (Research Triangle Park, NC: Southern Growth Policies Board, 1986).

[4] Among the conceptual contributions found valuable in *ATF* by other researchers are the sim-

plified set of industrial sectors and the classification of counties according to their relative access to the nation's system of interstate highways and metropolitan centers.

[5] Lionel Beaulieu (Ed.), *Rural South in Crisis: The Challenge for the Future* (Boulder, CO: Westview Press, 1988).

[6] DeWitt John, Sandra Batie, and Kim Norris, *A Brighter Future for Rural America? Strategies for Communities and States* (Washington, DC: National Governors' Association, 1988).

[7] Senator Robert H. Smith, "Rural Revitalization Does Not Come Without Effort," *State Legislatures*, August 1988.

[8] Central Economic Development Policy Planning Board for the State of Oklahoma, *Oklahoma's Strategic Economic Development Plan, 1988-1993* (Tulsa: Oklahoma Department of Commerce, October 1988), pp. 109-113.

[9] Stephen Cohen and John Zysman, *Manufacturing Matters: The Myth of the Post Industrial Economy* (New York: Basic Books, 1986).

[10] Robert W. Gilmer and Allen G. Pulsipher, "Recent Economic Performance and the Economic Future of the Rural South," *Forum for Applied Science and Public Policy*, 1 (Summer, 1986): 109-118.

[11] Thomas E. Till, *The Shadows in the Sunbelt Report: Has the Wave of New Factory Jobs Ended in the Metropolitan South?* Unpublished paper presented to the Southern Regional Science Association Conference, Atlanta, Georgia, March 26-28, 1987.

After the Recession:
Industrial Dynamics & Infrastructure

Rural economies in the South are constantly changing and, accordingly, yield little reliable information that is susceptible to quick analysis or conventional wisdom. Rural renaissance, economic turnarounds, nonmetropolitan "shade," and business cycle rebounds are among the artful terms applied by the region's many avid students, occasionally with some accuracy. *After the Factories* supported (with qualifications) certain of these positions, although caveats in the report acknowledged the interpretive difficulties caused by a recessionary trough (the deepest since the Great Depression) into which the national and regional economies had fallen.

This chapter has two central tasks. The first is to re-examine industrial dynamics over a full, business cycle neutral period (1977-84) during which structural changes tend to dominate and purely cyclical effects are minimized. A supplemental task has been to note the exceptions which particular states pose in this analysis, and additional detail is appended for comparison among all SGPB states. The second major task is to examine more fully factors which explain nonmetro growth of manufacturing and total employment, particularly the growth effects of infrastructure in nonmetro counties.

Metropolitan Jobs, Nonmetropolitan Labor

Those familiar with United States cities have long observed the relative concentrations of jobs in central cities and labor force in suburbs. European cities are beginning to resemble this pattern just as jobs in the U.S. are becoming much more dispersed into suburban rings of cities. One result is a more uniform distribution of jobs across all parts of United States metro-

Table II-1

Distribution of Employment, Population, and Labor Force by County Location 1977, 1984

Southern Growth Policies Board Region

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	280	8.62	8.04	10.21	9.51
Tier	74	2.21	1.95	2.81	2.60
Corridor	92	4.57	4.22	4.70	4.66
Adjacent	171	4.52	4.14	6.17	5.82
Adj/Cor	199	9.81	9.30	11.35	10.73
Nonmetro	816	29.73	27.66	35.24	33.33
Metro	272	70.27	72.34	64.76	66.67

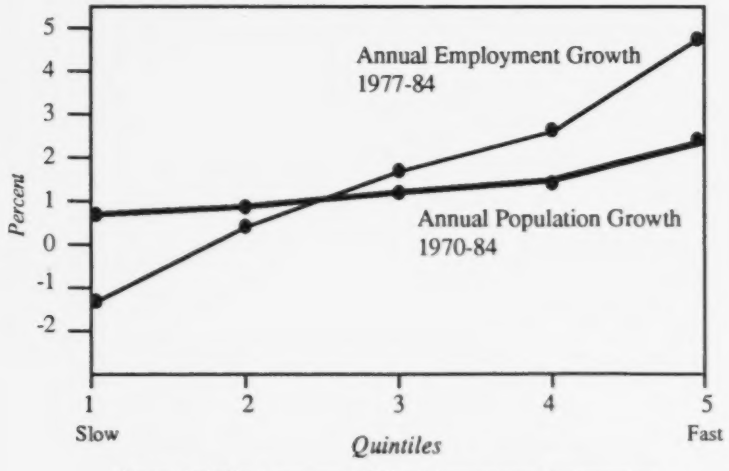
politan areas. Because the geographic dispersion of employment now reaches to the edge of the Metropolitan Statistical Area (MSA) suburban counties, nonmetropolitan commuter distances to outlying jobs are effectively reduced. The more even spread of jobs across, and their continued concentration within, MSAs implies a heightened regional division of labor; workers from nearby nonmetro areas increasingly are drawn by shorter commutes, higher wages, and greater selection of employment to outlying metropolitan counties that supply superior infrastructure and services to some of the fastest growing and most technologically advanced sectors. This diffusion of jobs to MSA perimeters then ripples even further out through the adjacent counties and along commuting corridors of nonmetropolitan America. Thus, nonmetro areas tend to serve increasingly as labor pools while metropolitan centers remain regional job pools.

The patterns of relative job and population concentrations are clearly evident throughout the SGPB states. It is seen in *Table II-1* by comparing the percentage of a state's population living in metro and nonmetro counties with the percentage of that state's labor force living in the same two areas. Except for Florida, which is predominantly urban, the differences in those percentages of population and jobs ranges from 5.0 percent to 7.6 percent. In the total SGPB region, the difference is 5.6 points. This means that the average share of the region's total employment living in metro counties (72.3 percent) is 5.6 percentage points greater than the share of its total labor force living in metro counties (66.7 percent).

The 12 states' nonmetro counties are separated further according to five subcomponents based on location: *remote, tier, corridor, adjacent, and adjacent/corridor*. The differences between shares of employment and shares of labor force are compared, as shown in Appendix C. In only four of 60 locational groupings are 1984 shares of employment greater than labor shares: *corridor* county groups in Kentucky and Mississippi, *tier* counties in Alabama, and *remote* counties in Florida. Subsequent analysis reveals total employment growth in SGPB nonmetro counties is in fact propelled by rising job to labor force ratios. Thus, within the nonmetro South, a process identical to that for the SGPB region as a whole is underway.

Figure II-1

Annual Growth Rates for Employment and Population, by Quintiles



Note: Quintile 1 represent 20% of slowest growing counties;
Quintile 2 represents 20% of next slowest growing counties, etc.

The patterns noted are quite typical of unbalanced growth and settlement in all developed counties. Moreover, the growth patterns up through 1984 suggest continued divergence within nonmetro counties. For example, if all nonmetro counties are grouped by quintiles from the slowest growing one-fifth up through the fastest growing one-fifth, jobs in the fastest fifth grew about 4.8 percent annually while its counties' population grew about 2.3 percent (Figure II-1). On the other hand, the slowest growing fifth actually lost jobs (-1.2 percent annually) even as its population continued growing at about 0.8 percent per year. Another comparison contrasts 1977-84 growth rates for each of the nonmetropolitan location groups with metro rates. Appendix B combines this information for the full SGPB region and its member states. *Table II-3* makes plain the considerably higher metro growth rates throughout the SGPB region and gives evidence that jobs will continue to concentrate in metro areas relative to all nonmetro locations and relative to the population and labor force. Labor force growth will be shown later as an important determinant of growth in nonmetro counties.

Industry Mix and Growth

Industry mix is correctly touted as a key determinant of area growth. If a county or region hosts above average shares of fast-growing industries, simple arithmetic leads to the obvious conclusion about their effect on direct growth. Sometimes more subtle qualities of in-

Figure II-2

Non-Agricultural Employment by Industry
Metro & Nonmetro South, 1984

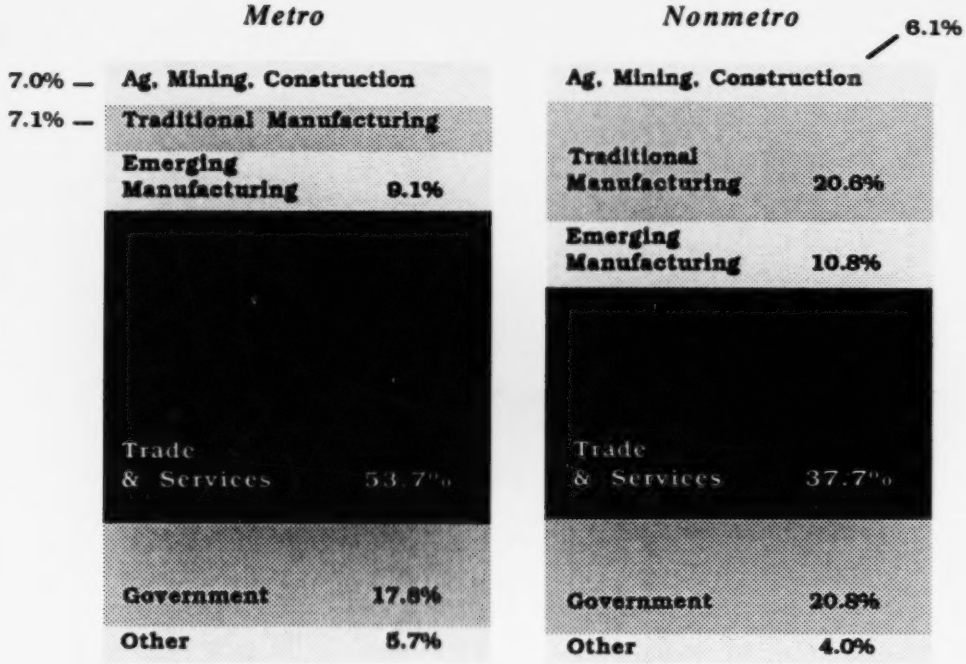


Table II-2

Annual Compound Rates of Growth in Employment by Industry Cluster, SGPB South

Cluster	Nonmetro 1977-82	Nonmetro 1982-84	Nonmetro 1977-84	Metro 1977-84
Construction	1.6	21.9	7.0	9.3
Traditional Durables	-1.3	3.1	0.0	-0.7
Traditional Nondurables	-1.0	0.8	-0.5	-1.7
Emerging Durables	3.0	2.8	2.9	2.4
Emerging Nondurables	1.5	1.8	1.6	2.7
Urban Services	2.8	3.7	3.1	4.3
Consumer Services	3.9	1.2	3.1	5.1
Producer Services	4.0	1.6	3.3	4.2
Civilian Government	—	—	1.0	1.5

Notes: Agribusiness and Mining are too small for reliable measurement.
Civilian Government employment for 1982 is unavailable.

dustry mix are additionally important because of their "catalytic" effect, i.e., they may help induce growth of other sectors. The producer and urban services categories frequently are cited for this effect.

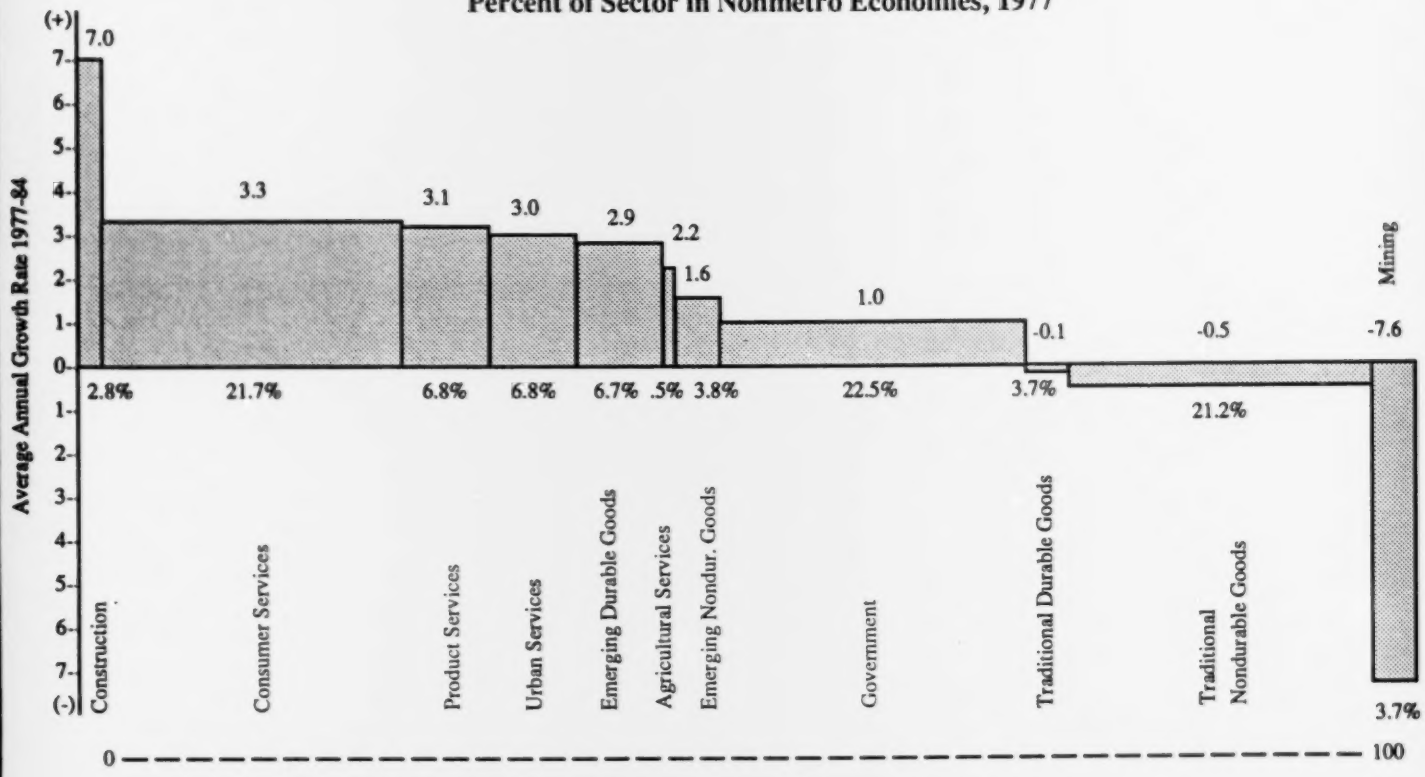
To get a full appreciation of recent industry mix according to metro and nonmetro location of counties, refer to *Figure II-2*. At first glance, one sees immediately the considerable advantage held by metro areas in their higher concentration of fast-growing services and their much lower concentration of slower-growing manufacturing. More careful inspection shows that *metro and nonmetro areas have roughly equal proportions of emerging manufacturing industries, but nonmetro areas are far more concentrated on traditional manufacturing*. There are few deviations from this pattern among SGPB member states. Only in Kentucky do metro counties have percentages of manufacturing higher than nonmetro areas, although the metro/nonmetro percentages are quite similar in Florida and Oklahoma as well (see Appendix C).

A more detailed analysis of the growth of the industrial clusters in nonmetro counties is shown in *Table II-2*; growth is separated into the recessionary period (1977-1982) and the post-recessionary period (1982-1984). The most striking figures are the recovery of durable goods manufacturing and construction following the recession, matched by a lower rate of growth in consumer and production services. Apparently, the region re-established to some extent the more traditional pattern of manufacturing growth in rural settings while services expanded in the cities. The high growth rates of urban services and construction could be due to the urbanization of many *adjacent* nonmetro counties.

Industrial mix data for all nonmetro counties can be contrasted, with the growth rates for each sector in that mix. When presented graphically in *Figure II-3* (see page 18), one can visualize much more clearly from the differing growth rates what the future mix is likely to be. The left side of the figure includes the fastest growing sectors and the bottom scale shows their appropriate share of total employment in 1977. It is easy to see the growing importance of all

Figure II-3

Percent of Sector in Nonmetro Economies, 1977



service sectors in nonmetro counties, although emerging manufacturing and government also will become more prominent in the future. The right side of the figure shows the lessened importance of traditional manufacturing industries and mining, even after the modest 1982-1984 recovery.

Manufacturing Matters, But Less So

As outlined above, nonmetro growth of manufacturing is nearly overwhelmed by growth of service industries. Even if some share of growth in producer services were attributed to manufacturing as Zysman and Cohen suggest, there remain substantial growth differences between manufacturing and service industry employment. Some of this growth shortfall in manufacturing is due to the departure of firms and industries while other reductions might be temporary, caused by the high dollar, which depresses exports, or by productivity improvements that reduce the amount of labor required per unit of output.

Metropolitan counties as a group grew at 0.61 percent per year while nonmetro counties followed at 0.48 percent per year. But region-wide metro superiority can be traced to the extraordinary influence of two factors: very rapid metro growth of emerging nondurable industries region-wide and rapid metro manufacturing growth in four of the largest states.

As shown in *Table II-2*, all manufacturing except the emerging nondurable sectors, grew faster in nonmetro counties, but the much more rapid growth rate of the latter in metro centers is essentially responsible for their higher average growth in total man-ufacturing. In similar fashion, manufacturing employment grew fastest in eight of 12 SGPB states' nonmetro counties, but much faster metro manufacturing growth in the four remaining large states, Florida,

Table II-3

Annual Employment Growth Rate for Major Industry Categories by State, 1977-84

State	Manufacturing		Government		Services		Total	
	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro	Metro	Nonmetro
AL	-1.29	1.15	1.03	0.28	3.07	2.71	1.65	1.64
AR	-0.64	1.06	1.56	0.63	3.42	3.14	2.24	2.06
FL	4.10	1.45	1.73	1.77	5.57	5.57	5.45	3.78
GA	1.39	1.51	2.21	1.15	4.66	3.62	3.97	2.52
KY	-2.43	-0.42	-.29	.86	2.73	2.48	1.23	1.09
LA	-1.43	-1.05	1.7	2.01	3.66	3.47	2.78	2.25
MS	-3.27	.26	1.62	.09	3.20	2.27	1.56	1.3
NC	1.5	1.23	1.84	1.91	4.29	3.62	3.15	2.38
OK	1.21	-0.25	2.21	1.67	4.03	2.7	3.49	2.29
SC	-0.26	0.42	1.62	0.96	4.3	3.95	2.57	2.2
TN	-0.44	0.31	0.27	-0.14	3.59	2.79	2.18	1.18
VA	-0.05	-2.02	1.14	0.91	4.95	2.75	3.46	1.32
SGPB	0.61	0.48	1.46	1.03	4.44	3.20	3.44	1.93

North Carolina, Oklahoma and Virginia, tipped the SGPB totals in their direction, shown in *Table II-3* (see page 19).

The unevenness of manufacturing growth observed in the South has led a few to conclude that recovery in some states from the 1980-82 recession indicated either reasonably good health in the southern manufacturing base or that manufacturing continued to favor southern nonmetro areas.[1] Part of the confusion is based on the old dicta that "where you stand depends on where you sit." That is, conclusions about the South as a whole will differ considerably if one generalizes by using manufacturing growth data from the eight nonmetro vs. the four metro-dominated states. It is perhaps better to acknowledge the essential differences and unavoidable heterogeneity among southern states by paying less attention to their "average."

One particularly useful aspect of manufacturing growth in which detailed comparisons are warranted is the cyclical volatility of manufacturing. Numerous researchers have documented the widely familiar experience of rapid loss and rebound of manufacturing employment as the economy moves through a business cycle. This report adds 1984 data (the early recovery phase from the 1982 recession) to the 1977 and 1982 data originally used in *After The Factories*. The three periods for which annual growth rates for manufacturing are calculated are (1) entering the recessionary trough (1977-1982); (2) beginning the recovery (1982-1984); and (3) over the full, business cycle neutral structural period (1977-1984). These rates are plotted on bar graphs for both metro and nonmetro counties of each state, shown in *Figure II-4*. (**Note**: except for this particular section, all industry growth rates reported elsewhere in this study were calculated using the 1977-84 period). They show the 1977-82 growth superiority of metro centers begin to wane (-0.46) as the economy recovered; between 1982-1984 nonmetro manufacturing growth (1.57) was higher than metro manufacturing growth in most states and in the SGPB region.

▲

Employment Growth and Infrastructure

Policymakers throughout the nation first learned to use the term "infrastructure" when it became necessary to reconsider their systems of public works, large facilities and basic service institutions that were disintegrating from long-term use and because of the loss of federal support funds. If a locality's infrastructure problem wasn't one of disrepair, then it was found to be extraordinarily expensive to the rapidly growing regions that finance infrastructure solely from local sources. Finally, it was realized gradually that the migration of private capital from established economies with existing infrastructures to new economies that required them resulted in costly duplications.

None of this would be of much significance if infrastructure were either a symbolic luxury or an inexpensive discretionary budget item. The fact is, advanced urban economies require a deep, efficient base of public works and essential services to remain competitive.

Infrastructure is costly, more difficult to finance publicly in the federal contractions of the 1980s, and absolutely essential to the development of local economies which otherwise enjoy favorable business climates. Gone, or at least going fast, are the days when all a firm had to do was bundle up all its machines, equipment, and key personnel from one place and plop them down on a cheap piece of undeveloped land with low-cost labor within commuting distance. These "late product cycle" branch plant technologies of the rural South have lost much of their comparative advantage in the world division of labor after being buffeted by round after round of import competition. The renewed importance of infrastructure, particularly efficiently organized and located services, shows up as the major feature of metropolitan centers, and it may figure prominently in the prospects of nonmetropolitan economies as well.

Figure II-4

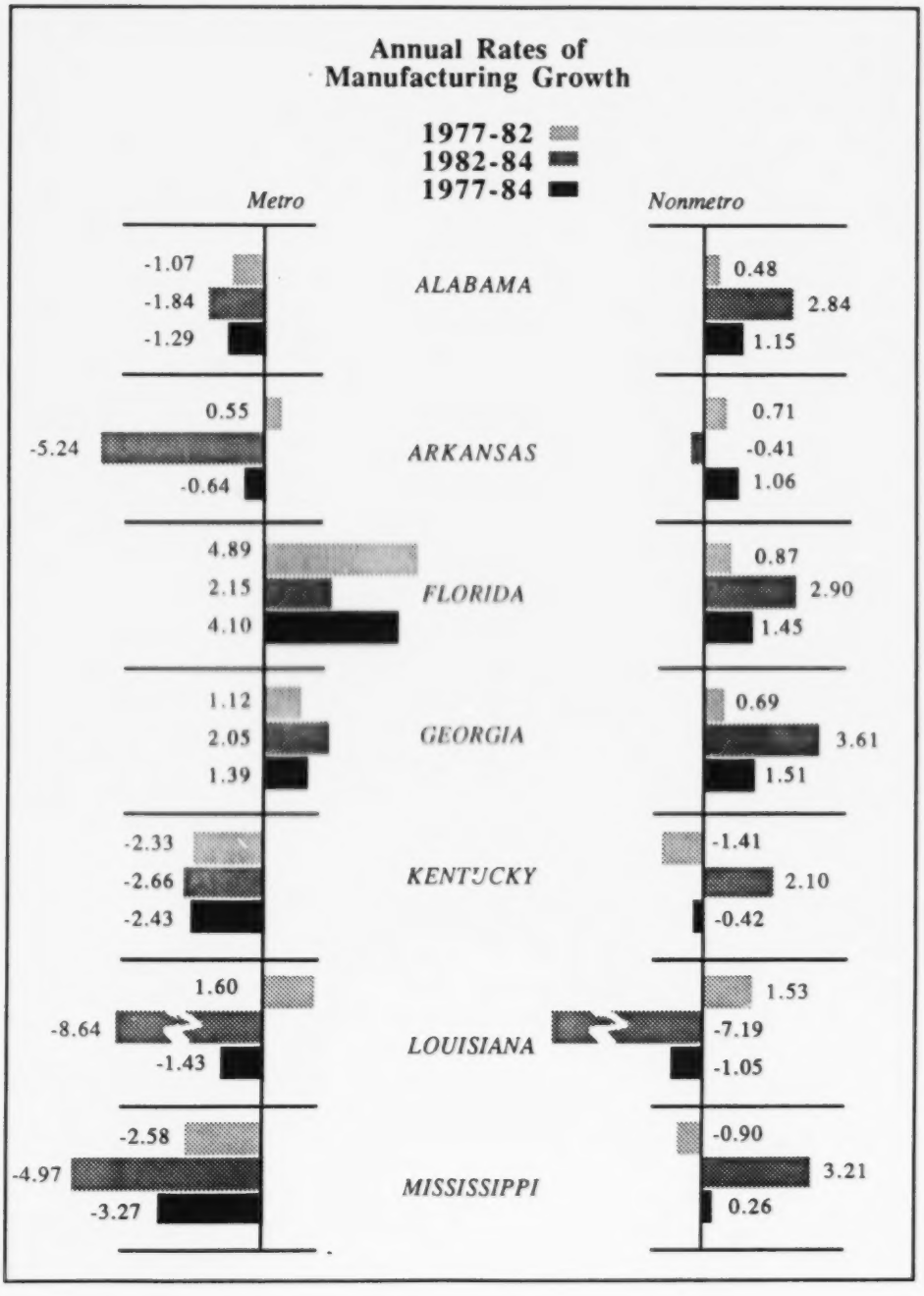
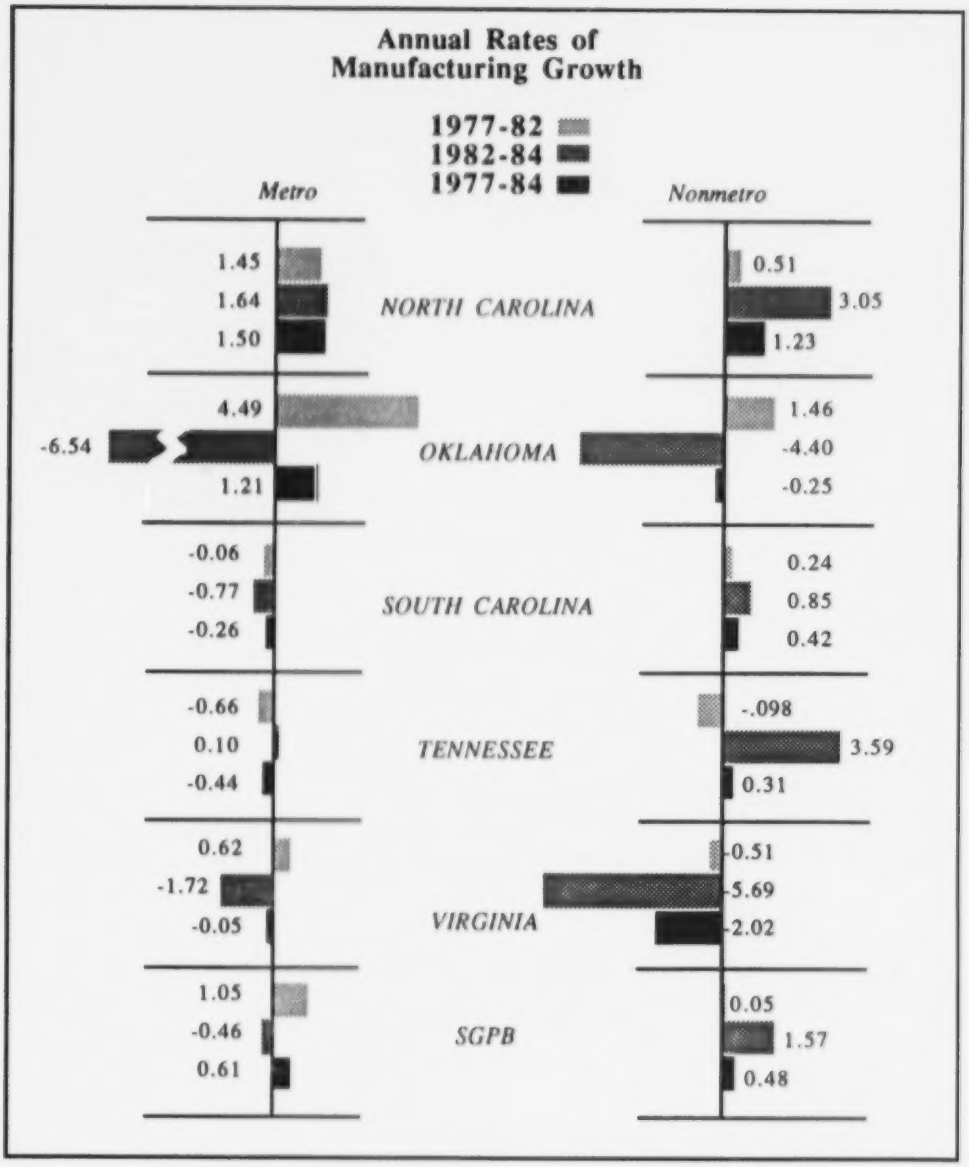

Annual Rates of
Manufacturing Growth
1977-82
1982-84
1977-84
Metro
Nonmetro
-1.07
-1.84
-1.29
ALABAMA
0.48
2.84
1.15
0.55
-5.24
-0.64
ARKANSAS
0.71
-0.41
1.06
4.89
2.15
4.10
FLORIDA
0.87
2.90
1.45
1.12
2.05
1.39
GEORGIA
0.69
3.61
1.51
-2.33
-2.66
-2.43
KENTUCKY
-1.41
2.10
-0.42
1.60
-8.64
-1.43
LOUISIANA
1.53
-7.19
-1.05
-2.58
-4.97
-3.27
MISSISSIPPI
-0.90
3.21
0.26

Figure II-4, continued



The concentration of infrastructure services, along with recent expansion of producer services and small business proprietorships, has refocused attention on the general concept of "agglomeration economies," that is, the productive efficiencies which can be shared in urban (not necessarily metropolitan) centers. All of the infrastructure is not of equal importance, nor is much of it directly under the control of state policymakers. But its key components of the infrastructure are well within reach of state policymakers. Thompson states the point clearly: "Those who allocate state funds for higher education and transportation have more control over the population settlement pattern of a state than they know or perhaps want to know."[2] These forms of physical and intellectual infrastructure include several modes (air service and modern highways) and levels (baccalaureate, masters, and doctoral degree-granting institutions) which may enable some local economies to grow and prosper.

The following section will focus on growth effects of the interstate highway system, levels of county air service, enrollment levels in area colleges and enrollment in Ph.D. granting universities. Together, these are some of the most potent infrastructure policies open to state policymakers.

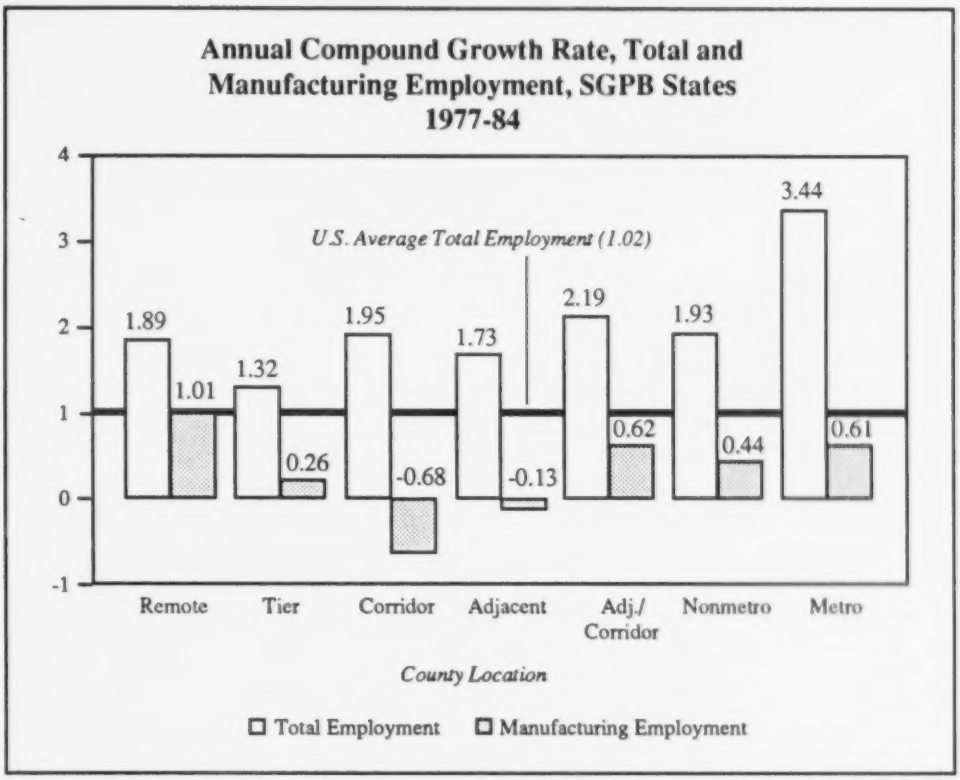
Employment Growth in Nonmetropolitan Counties

Growth of employment between 1977-1982 was examined exhaustively in *ATF* from many different points of view. This consisted principally of contrasting average growth rates for various subgroups of SGPB counties. The lengthened time span and shift in the Board's membership argues for at least a simple benchmarking of overall growth rates in this study before going on to new analytic approaches.

As seen in *Figure II-5* (see page 24), growth rates for metro versus nonmetro show the former enjoys a pronounced advantage in *total* employment. The slight metro advantage in *manufacturing* growth, as discussed elsewhere in this study, is due mainly to its growth in the largest states' metro areas and to the emerging durables sector. Growth patterns among groups of nonmetro counties are even more varied. *Adjacent/corridor* counties grew fastest in total employment (manufacturing growth there edging ahead of metro rates) while manufacturing growth in remote counties outpaced that of *all* other county groupings. *Corridor* counties fared worst of all with the lowest growth rates in both employment categories. This may in fact reflect an artifact of our reclassification of counties; some of those classified *corridor* by 1980 definitions in *ATF* were reclassified *corridor/adjacent* because the 1984 definitions expanded the number of metropolitan counties to which they became adjacent.[3] It may also reflect a change in fortunes of *corridor* counties, but this seems unlikely. Nonetheless, *Figure II-5* amply demonstrates the exceptional diversity of growth within nonmetro counties. Other county groupings and subdivisions could be established and their growth patterns compared. From this, one might fashion a rich mosaic of how growth differs for SGPB counties.

Fortunately, there are other shortcut techniques which allow one to sift through large amounts of information about counties and then identify the types of information that best account for the growth observed. Single and multiple regression techniques can be applied to good effect in this situation. Other investigations that have applied these techniques to growth studies sometimes have encountered serious difficulties in finding powerful explanatory data.[4] These difficulties were avoided for the most part here, thereby allowing good insight into growth factors of SGPB counties, both nonmetropolitan and total counties.

Figure II-5



Accounting for Growth

This analysis consists of a systematic examination of growth rates and the factors correlated with or accountable for the growth observed. The pursuit of a fully specified causal model is well beyond the scope of this study, but prudent use of some statistical indicators from regression analysis help sort out and more carefully illustrate important growth factors.

In general, two types of statistical indicators are used. The first is a simplified single regression sign, which tests whether growth increases (POSITIVE) or decreases (NEGATIVE) as the measured value of a single factor grows larger. It is single because effects are measured for only one factor even though growth may be very intricately interconnected with other factors. The multiple regression sign indicates, also by positive or negative signs, the influence of a particular factor on growth after also controlling for (or "netting out") the general influence of other important factors. This latter index is derived from a generally specified regression model.[5] The multiple regression results prove valuable in sorting out the individual effects of some growth factors while also eliminating from consideration the duplication or redundancy of other factors that affect employment growth only weakly.

Table II-4

Percent of Employment by Industry Cluster, 1977

Cluster	Remote	Tier	Corridor	Adjacent	Adj/Cor	Metro	Nonmetro	Total
Agribusiness	0.5	0.5	0.3	0.4	0.5	0.3	0.5	0.4
Mining	5.7	2.6	2.2	3.7	2.6	2.4	3.6	2.8
Construction	2.5	2.5	2.9	2.5	3.1	4.2	2.8	3.8
Traditional Durables	2.9	4.6	3.0	4.3	4.3	2.4	3.7	2.8
Traditional Nondurables	20.7	24.0	19.0	23.4	20.7	7.9	21.2	11.9
Emerging Durables	6.8	7.2	7.0	6.1	6.8	6.7	6.7	6.7
Emerging Nondurables	2.6	3.4	5.1	2.9	4.8	3.4	3.8	3.5
Urban Services	6.9	6.7	7.7	6.1	6.6	12.1	6.8	10.5
Producer Services	6.9	5.8	8.3	5.9	6.5	12.4	6.8	10.7
Consumer Services	22.0	19.3	24.2	20.3	21.4	27.3	21.7	25.6
Government	22.3	23.4	20.4	23.9	22.8	21.0	22.5	21.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Combined Clusters								
Manufacturing	33.1	39.8	34.0	37.2	36.5	35.4	20.2	24.3
Services	35.9	31.8	40.1	32.3	34.6	51.8	35.3	46.9
Government	22.3	23.4	20.4	23.9	22.8	21.0	22.5	21.5

Source: Southern Growth Policies Board, 1988

Growth Factors

Earlier sections of this chapter stressed the potential importance of the county infrastructure, both physical and institutional, in establishing favorable conditions for growth. Among these are the following:

- Interstate highway access of county;
- Commercial airline operations in county airports;
- County colleges, as measured by enrollment in baccalaureate only institutions; and
- County research universities, as measured by enrollment in Ph.D. granting institutions.

While the infrastructure factors are of immediate concern, this analysis also examines the background effects of current county circumstances (e.g., nearness to metro areas, rate of economic restructuring, census region of state, jobs per thousand labor force members, 1977 industrial composition, total population, urban population, black population) and effects of education policy factors (e.g., percentage of population with college degrees, high school graduation or eighth grade completion).

These growth factors are tested against two measures, growth of manufacturing and total employment, by use of both single and multiple regression results. The procedure compares two indices: *single regression signs* which illustrate general growth relationships; and *multiple regression signs* which isolate the best, reduced set of factors behind growth relationships. Comparing the two shows which factors are eliminated and which among the single regression coefficients remain important.

Table II-5 summarizes the findings for comparisons discussed above. The results shown were obtained by estimating a series of models for alternative groups of variable measurements (e.g. numbers of people vs. percentages of people with differing education levels). Other research methods were used to reduce and modify provisional results. The final models represent the best, basic equations to explain nonmetro employment growth in SGPB states. These provide the base for expanded models, allowing the evaluation of additional growth factors of interest. That is, infrastructure variables are added to the base model variables to see whether the infrastructure retains any significant positive influence on growth.

In this table, any variable which has a statistically significant (i.e., not random or due to chance) expansionary effect on growth is shown as POSITIVE. Variables which have a significant depressing effect on growth are shown as NEGATIVE. Signs in parenthesis (+)/(-) indicate slight but insignificant "tendencies" as described above. In the basic equations, variables 1-5 are significant only for manufacturing growth, the sixth is significant for both manufacturing and total growth, and variables 7-11 are significant only for total growth. If the signs are then compared, the sign of each variable remains stable in both the single regression and basic model columns. This means that each factor retains its original effect on growth after all other effects have been considered.

Moving to the expanded equation column, manufacturing employment growth is dampened by high levels of 1977 employment in tourism, consumer services, urban services and traditional durable goods manufacturing. Manufacturing growth is propelled by growth of county labor supply and a county's ratio of jobs to labor force. Thus, manufacturing still responds favorably to a growing labor force, but the future growth of labor supply will be limited as fewer agricultural workers, women, and work-age youth are available to enter the 1990s labor market. Manufacturing growth also is accruing in counties where growth of total jobs outpaces growth of the labor force; in short, nonmetro manufacturing employment may be concentrating in selected, growing counties or, in some instances, re-employing out-of-work members of a stable labor force.

Table II-5

SGPB Nonmetro Growth Models

Variable Number	Total Growth Regression Signs			Explanatory Variables	Manufacturing Growth Regression Signs		
		Multiple Regression			Multiple Regression		
	Single Regression	Basic ($R^2 = 0.64$)	Expanded ($R^2 = 0.65$)		Expanded ($R^2 = 0.25$)	Basic ($R^2 = 0.25$)	Single Regression
1	positive	—	—	Job/Worker	positive	positive	(+)
2	(+)	—	—	Emerging Nondurable	negative	negative	(-)
3	positive	—	—	Consumer Services	negative	negative	(-)
4	positive	—	—	Urban Services	negative	negative	(-)
5	(+)	—	—	Tourism	negative	negative	negative
6	positive	positive	positive	Labor Growth	positive	positive	positive
7	positive	positive	positive	College Part. Rate	—	—	positive
8	positive	positive	positive	Non Degree Literacy	—	—	positive
9	positive	positive	positive	S. Atlantic states	—	—	positive
10	negative	negative	negative	Government	—	—	(-)
11	positive	positive	positive	College Enrollment	—	—	(+)
12	positive	—	(+)	University Enrollment	—	(-)	(+)
13	positive	—	positive	Corridor	—	(-)	positive
14	negative	—	negative	Tier	—	(-)	negative
15	positive	—	positive	Airport	—	(-)	positive

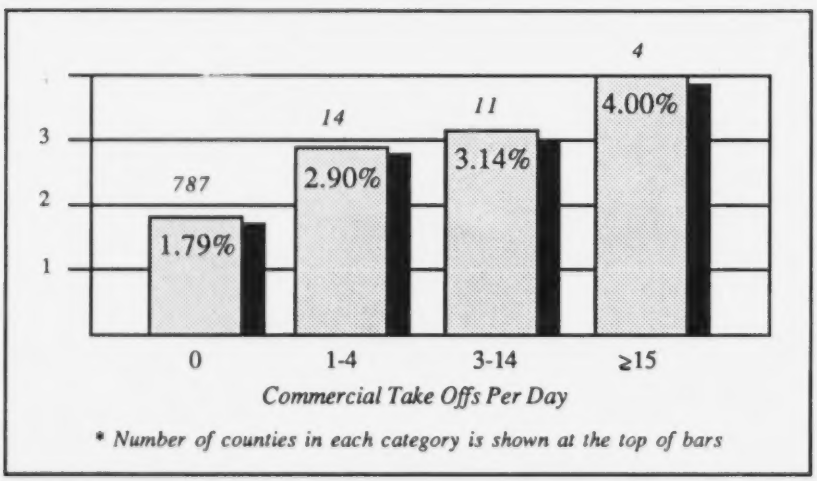
Note: The terms positive and negative indicate a significant effect on growth, while the signs (+), (-) represent an insignificant effect.

Growth in total employment, which is about five times the growth of manufacturing employment in the average county, appears to occur for wholly different reasons. Apart from high concentrations of government employment (which depress growth), a county's sectoral mix bears no significant relationship to overall growth; nor does labor supply growth, although the jobs-to-labor force ratio is important, as it is for manufacturing growth. Rather, growth results from the different influences of variables 7-11 in *Table II-5*. Current enrollment levels of local colleges, higher rates of college participation or literacy levels of nondegree holders among the adult population, plus being located in a state of the South Atlantic region, contribute to total growth. It should be emphasized now that other variables omitted at earlier stages of the model building process also are related in some degree to total and manufacturing growth, but retaining them in the equation confounds the effects of stronger variables and contributes virtually nothing to the overall explanation of growth. In short, their individual or partial effects are overwhelmed by the far more powerful variables in these models. In chapters that follow, some of the more relevant or interesting variables omitted here are explored in more depth. Variables 12-15 (*Table II-5*) were then added to form expanded equations which test infrastructure effects on growth, as discussed below.

It is now possible to evaluate whether the infrastructure variables, if added to the basic equations, are significant and if their signs are consistent with expected growth effects. The findings for manufacturing growth are quite surprising. First, none of the infrastructure variables proved significant in explaining manufacturing growth, nor were county university enrollments a significant variable for total employment growth. Highways, airports, and higher education facilities did not appear to stimulate manufacturing employment. However, transportation infrastructure variables were significant variables in explaining total employment. Scheduled airline operations per thousand county employees (AIRPORT) have expansionary effects on total employment, shown in *Figure II-6*, as does the presence of an interstate highway interchange (CORRIDOR) within the county. Quite consistent also is the *depressing effect* on

Figure II-6

Commercial Airport Traffic and Employment Growth, 1977-84



total growth in counties of being close to interstate highways but lacking highway interchanges. This finding reinforces a point made originally in *ATF*: an interstate highway helps counties if they enjoy *direct* access. But an interstate that merely abuts nearby counties lacking direct access can actually reduce their growth prospects.

One is led to conclude that total growth in nonmetro counties is influenced by some infrastructure advantages, but only at the margin: other basic qualities are more decisive in explaining total growth. State policymakers might be wise to consider a "balanced" set of programs for education and infrastructure if total growth is the objective.[6] Manufacturing growth appears to lack *any* systematic relationship to selected infrastructure measures. Apart from ensuring adequate labor surpluses, there is little evidence presented here on which to base reasonable policies to stimulate manufacturing growth. However, the lack of observable effects may indicate the importance of other wholly unique or particular conditions that stimulate some types of manufacturing in certain counties. Chapter V explores some of these possibilities.

Chapter Notes

[1] Gilmer and Pulsipher, 1986

[2] Wilbur R. Thompson, "Policy-Based Analysis for Local Economic Development," *Economic Development Quarterly* 1 (August, 1987), p. 203-213.

[3] Edward M. Bergman, *Industrial Transition Paths*. Economic Development Administration Final Report (Chapel Hill, NC: University of North Carolina Institute for Economic Development, 1988). The process of entry (and exit) of counties to the U.S. metropolitan system was recently modeled in a study of industrial restructuring in a 17-state region within which the SGPB is a major portion (Bergman, 1988)

[4] DeWitt John, Sanda Batie, and Kim Norris, (1988)

[5] A parallel set of metro models for total and manufacturing employment were also prepared. If measured purely by R^2, the metro models clearly are superior (Total: 85 vs. 0.65; manufacturing: 0.49 vs. 0.25) although their discussion is inappropriate as the object of much attention in a study of nonmetro counties. Their primary use was to track and compare results as an aid to final specification of the nonmetro model.

[6] See Edward M. Bergman, Gunther Maier, and Dana Weist, *The Impact of Highway Improvements and Other State Policies On the Income of Arkansas*. Technical and Policy Reports Submitted to Governor Clinton (Chapel Hill: University of North Carolina Institute for Economic Development, 1988).

Demographics & Recreation

One of the first caveats presented at most national rural development conferences is that there is no single "rural" America. The term, participants are told, encompasses a range of communities with a broad array of demographic, social, and economic conditions and with correspondingly different needs. Certain sections of the country, however, possess enough conditions and needs in common to give credence to regional analysis.[1] Even within this regional structure, however, southern counties differ from one another in important ways that can affect their economic development. This chapter will summarize the common features of the rural South and then analyze how variations among those features within the region influence growth of jobs and income.

Characteristics potentially important to the economic development of counties include size of population; race, age, and wages of people residing and working in a county; and cultural and recreational resources. Even though most of these variables are exogenous and lie outside of the influence of policy, they ought to be taken into account in development strategies.

The Rural South as a Region

The SGPB South, compared to other regions, has the largest proportion of its people—36 percent—residing in nonmetro counties. There are 816 nonmetropolitan counties in the 12 states. Despite the large share of people living in nonmetro counties, the nonmetro South is densely populated compared to other nonmetro regions. Nearly one-half of South Carolina's population is rural (live in towns of 2,500 or less), for instance, but the number of people per square mile is 103.4. That population density is at least double that of any state west of the Mississippi except California—and most western states are much more urbanized (high proportion of population living in cities). As a result of high population density, people in the South are able to more readily commute to work in metro areas or across county lines. Nearly one-half of the South's nonmetro people have good access to at least one interstate highway, and most places in the rural South are within a reasonable drive of a metro center and a commercial airport. In fact, although 36 percent of the people live in nonmetro counties, only 28 percent of the region's jobs are in those counties. One-half of the South's nonmetropolitan population lives in counties adjacent to metropolitan statistical areas (MSAs) in 1985. The southern region had the highest proportion of its labor force working outside of counties of residence in 1980, more than 22 percent.

The metro South, however, has absorbed much of the rapid growth attributed to the Sunbelt. Even in the 1970s, the time of the well-known "rural turnabout" when nonmetro growth exceeded metro growth nationally, the South was the exception to the rule. Southern metro counties grew faster than nonmetro counties even during this period. Then, in the early 1980s, when another reversal was noted back toward the cities, it was the rapid growth of southern cities relative to nonmetro counties that distorted the larger national picture. Population growth in the nation was actually quite balanced if one excludes the South. Between 1980 and 1985, the population growth rate in southern metro counties was more than double the growth rate of metro counties nationally. Today, however, in the midst of a farm crisis, rural areas in other regions generally are declining. *Thus, growth in the nonmetro South is low compared to the metro South, but is no longer low compared to the nonmetro counties in other regions of the nation.*

In most regions of the country, large numbers of blacks live in central cities. Although blacks are moving into suburbs as more and more enter the middle and upper classes, few outside of the South live in rural areas. In the South, many blacks farmed for a living, and although fewer now work as farmers, many blacks have chosen to live near their rural roots. In fact, as anthropologist Carol Stack has found, many blacks who moved to northern cities in search of economic opportunities are returning to the rural South. In the South, metro and nonmetro counties have nearly identical proportions of minority population—20 and 21 percent; 238 nonmetro counties are more than one-third minority.

Wealth also distinguishes the rural South from other regions—a distinctive quality the South would rather not have. The populations of nonmetro counties in the South are among the poorest in the nation. For instance, 1985 per capita income in nonmetro counties was only 72 percent of that in metro counties; the nonmetro incidence of poverty was 22 percent (and 44 percent for nonmetro blacks).[2] In the past, wealth reflected wage levels, and this condition was used to attract industry and support growth. This chapter looks at this relationship in more recent years to see how extensively it still holds.

Differences Among States Within the Region

Although there are general characteristics common to much of the nonmetro South, there also are distinctive differences among states within the region, some of which are briefly described in Appendix A. For example, the region's minority population is more highly concentrated in the Deep South and along the eastern seaboard and much less so in the northwestern parts of the region. It is only four percent in Kentucky and Oklahoma. Levels of educational attainment and per capita income are much higher in nonmetro counties of Virginia and Florida, possibly due to the impacts of their large and affluent urban areas. Population growth in nonmetro Florida, where retirement communities and resorts are moving farther and farther out from the cities, is faster than in metro counties of any other southern state. Even the ruralness is not uniform across the region. The percentage of the population living in nonmetro counties ranges from Mississippi, which is 70 percent nonmetro, to Florida, which is only nine percent nonmetro.

Even the general attributes of "rural," smallness of scale and isolation, do not uniformly distinguish rural from urban. Rural communities can be either near or distant to large cities and either close enough to each other to achieve economies of scale through cooperation or so isolated they are forced to fend for themselves. They can be poor or quite affluent, and physically they can be attractive vacation settings or very ordinary.

If each state has its own special characteristics, why analyze the states together as a region? First, there are enough similar conditions and problems among southern states that distinguish the region from other regions to warrant a regional analysis. There are no exceptions among states, for example, to the fact that employment rates, per capita income, and educational attainment are lower by approximately similar proportions in nonmetro counties as in metro counties. Second, state borders also can be artificial and misleading, and thus no better than a regional analysis. For instance, the western counties of North Carolina are more similar in most respects to counties in eastern Tennessee than to counties in eastern North Carolina; the panhandle counties of Florida are more like southern Georgia or Alabama than like southern Florida. Joel Garreaux's popular book, *The Nine Nations of North America*, suggests unconventional borders that reflect functional groupings according to economies and cultures that probably are more appropriate for policy than more traditional state boundaries.

Population, Ruralness, and Growth

Does the "ruralness" of a county (the proportion of its population residing in the open country or in towns of less than 2,500) affect the employment growth rate?

Degree of ruralness, measured as the percentage of population that is designated "rural" by the U.S. Census, bears little relationship to employment growth in the South. There is, however, an association between ruralness and per capita income. Counties with less than 50 percent rural population have the highest average per capita income, $8,515. In contrast, counties that are completely rural have the lowest per capita income, $6,444. Of the completely rural southern counties, 107 are classified as persistent poverty counties by USDA, and 92 are USDA "farming dependent counties" (those with an average of more than 20 percent of total labor and proprietor income from agriculture in the 1970s).

Table III-1

Ruralness and Growth

Percent Rural Population	Annual Employment Growth, 1977-84	Per Capita Income, 1985	Unemployment Rate, 1985	Number of Counties
<65	1.81	$8173	9.4	277
65-100	2.10	7683	9.8	287
100	2.02	7126	10.3	252

How does county population and the county's relation to metropolitan areas affect growth in employment and per capita income?

Calvin Beale of the USDA devised more discriminating categories of nonmetro counties that are based on size of population and whether or not it is adjacent to a metropolitan area. There is no observable effect of scale of population and adjacency to a metro center on employment growth (see *Table III-2*). Of nonadjacent counties (which include our *remote*, *tier*, and *corridor* counties), those that are completely rural show approximately the same annual growth

Table III-2

USDA Nonmetro Classifications, Employment and Income Growth

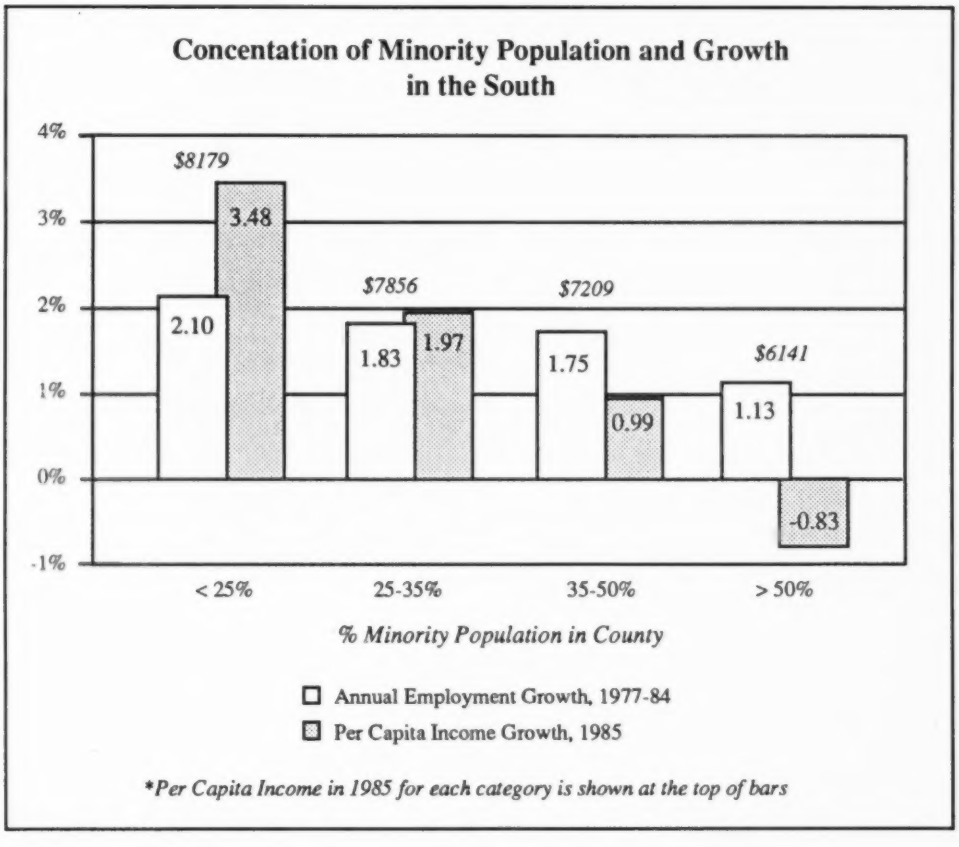
County Classification	Annual Growth in Employment 1977-84	Per Capita Income
Adjacent, Urban Population > 20,000	2.07	$8746
Nonadjacent, Urban Population > 20,000	2.31	$8485
Adjacent, Urban Population < 20,000	2.05	$7818
Nonadjacent, Urban Population < 20,000	1.45	$7424
Adjacent, Urban Population = 0	1.81	$7318
Nonadjacent, Urban Population = 0	2.07	$6806

rate as the *remotes* discussed above—2.07 percent. However, the counties with the largest urban population (greater than 20,000) grew at the rapid rate of 2.31 percent annually, while the non-adjacent counties with mid-range urban population of less than 20,000 experienced very slow growth—1.45 percent. However, per capita income follows the same pattern described above for remotes and all nonmetro counties: the more rural counties have lower income.

Minority Population and Growth

For many years, growth came slowly to counties with large black populations. State development agencies openly admitted that businesses did not like to move into counties where more than one-third of the population was black and that they did little to encourage the selection of those counties if this factor would jeopardize the recruitment effort. The analysis of race in *After the Factories* revealed that counties with fastest employment growth between 1977-1982 were those with low minority population, high education levels, and high income. Further, it found minority population to be a stronger indicator of lack of growth than education level, even among poor counties. Although education levels were similar in counties with high

Figure III-1



minority populations (greater that 33 percent) and low minority populations (less than 33 percent), the high minority counties had lower growth rates.

The analysis of employment growth from 1977-1984 suggests that race is still a factor, though the strongest tipping point appears to be higher than one-third. Counties with 35-50 percent minority population grew slightly slower than the nonmetro average, but those counties with more than 50 percent minority population had an annual growth rate of only 1.13 percent. (See *Figure III-1* on page 33.)

Nearly one-third of this group of counties are classified by USDA as persistent poverty counties. These include a great diversity—the impoverished counties of Appalachia and relatively wealthy, economically healthy counties in other parts of the South. In fact, when Kentucky, Tennessee, and Virginia counties are removed from the sample (these states account for most of the Appalachian counties and also have low nonmetro employment growth during the period), the remaining counties with less than five percent minority population show the highest employment growth and the second highest per capita income of any grouping.

The per capita income and its growth present a much more distressing picture of rural black economies. More than one-half of the counties that are more than 50 percent black are classified as "persistent poverty" counties by USDA; these are counties in which per capita income has remained in the lowest quartile nationally over a 20-year period. The actual per

Figure III-2

Race, Education, and Employment Growth Rate, 1977-84

Percent of Adults Completing High School, 1986

Percent Black Population	Low	Medium	High	
Low	1.40 *103*	1.79 *68*	2.83 *101*	2.16
Medium	0.94 *45*	1.89 *105*	2.24 *122*	2.00
High	1.43 *124*	1.53 *99*	1.89 *49*	1.64
	1.32	1.75	2.31	

Italicized numbers represent number of counties

capita income—without even taking inflation into account—was lower in 1985 than in 1981 in one-half of counties that are 50 percent black. That may help explain the fact that 42 percent of all rural blacks were living below the poverty line in 1986.

How much influence do education and other variables exert on the relationship between growth and minority concentration?

Because blacks in rural parts of the South have lower levels of educational attainment, which has been shown to influence employment growth, it is not clear whether the differences in employment growth are attributable to race or education. To examine the interrelationships, growth rates for employment and income and the unemployment rates in 1985 were calculated for the 272 counties with the lowest concentration of blacks (less than 5.1 percent), the 272 counties with the highest concentration (more than 30.3 percent), and the 272 counties in the middle, using three levels of high school completion rates among adults: the lowest one-third, the middle one-third, and the highest one-third (*Figures III-2* and *III-3*.).

The results indicate that educational attainment has a greater effect in counties with low concentrations of blacks than in counties with high concentrations. Where black populations are relatively large, a high level of education doesn't add many jobs. In counties with small black populations, however, it does. Growth of per capita income is stimulated at all levels by higher

Figure III-3

Race, Education and Per Capita Income Growth, 1981-85

Percent of Adults Completing High School, 1986

Percent Black Population	Low	Medium	High	
Low	1.86 *103*	2.90 *68*	3.68 *101*	2.99
Medium	2.33 *45*	2.72 *105*	3.97 *122*	3.37
High	0.57 *124*	0.60 *99*	1.91 *49*	1.04
	1.41	2.07	3.45	

Italicized numbers represent number of counties

educational levels. Per capita income in counties with fewer blacks and more education grew more than six times as fast as counties with the largest concentrations of blacks and lowest concentration of high school graduates. Employment grew twice as fast in the former group of counties as in the latter.

Income and Job Growth

Are people in nonmetro counties who have gained jobs better off now than they were at the start of the period?

After the Factories found that employment growth varied directly with per capita income. That pattern is confirmed in this report; counties with higher growth rates also tend to have higher per capita incomes. The relationship, however, is quite weak. If anything, the data show that growth and wealth are not synonymous. Further, most counties have lost ground in attempts to improve their standards of living. In about 32 percent of all nonmetro counties per capita income did not rise between 1981 and 1985, and in 75 percent of the counties it did not rise as much as inflation, as measured by the rise in the consumer price index. Thus, the purchasing power for the average resident in three out of four nonmetro counties (as well as three out of five metro counties) either remained constant or decreased over the four year period. The consumer price index grew by 3.3 percent between 1981 and 1985 while nonmetro income grew at a rate of only 2.6 percent. This seems to support the charges that real income is not rising and that more low-wage new jobs rather than high-wage jobs are being created. The interviews conducted for *Reviving the Rural Factory* confirmed that even manufacturing industries which are more automated and more progressive still seek areas where wages are low.

The slower growth in per capita income in nonmetro counties indicates a widening gap between metro and nonmetro counties. The very low rate of growth of per capita income in counties with large black populations, even where employment is growing, indicates that the standard of living may actually be declining.

Table III-3

Income, Income Growth, Unemployment Rates and Employment Growth, 1977-84

Annual Rates of Employment Change, 1977-84	Number of Counties	Annual Rate of Per Capita Income Change, 1981-85	Per Capita Income 1985	Unemployment Rates 1985
> 4%	117	6.0%	$8528	8.3%
3% to 4%	96	1.9%	8000	9.0%
2% to 3%	149	1.6%	8007	9.2%
1% to 2%	161	1.1%	7723	9.6%
0 to 1%	136	0.6%	7474	10.7%
< 0	153	0.4%	7232	11.8%

Does an infusion of new jobs increase average incomes of the people of the county?

There is some evidence that wealth is associated with job growth. At the high end of the scale—counties with 1980 per capita income above 110 percent of the nonmetro average, (or greater than $8,509)—jobs grew at a rate of 2.31 percent between 1977-84. In contrast, the most distressed rural counties, those 208 "persistent poverty" counties that have remained in the lowest quintile of rates of poverty for 20 consecutive years, had an annual growth rate of only 1.63 percent—lower than the nonmetro average growth rate but still well above the United States average rate. However, the counties that are currently poorest on average—the 75 counties with per capita income less than 70 percent of the nonmetro average (less than $5,415)—surprisingly gained new jobs at the rate of 2.14 percent per year Despite their above-average growth rates, these poorer counties had high rates of unemployment in both 1982 and 1985, which suggests that the growth was less than was needed or that many of the new jobs went to people from outside of the counties.

New jobs do raise the per capita income, but only significantly in the fastest growth counties, as shown in *Table III-3*. At employment growth rates of more than four percent, per capita income grows faster than the consumer price index. Below four percent growth, per capita income effects are weaker, although the simple relationship holds fast.

Unemployment and Employment Growth

Does new job growth substantially bring down unemployment?

Average unemployment in nonmetro counties fell from 11.4 percent in 1982 to 9.7 percent in 1985, while in metro counties it dropped from 8.4 percent to 6.3 percent. But even as rates of unemployment fell, the nonmetro to metro ratio increased. In 1982 the metro rate in the South was 15 percent higher than the metro rate. In 1985, even though it fell, it was 33 percent higher than the metro rate. And, as most analysts acknowledge, nonmetro unemployment rates are more likely to be understated due to greater incidence of discouraged and underemployed workers.

In nonmetro counties, local unemployment rates bear a strong relationship to employment growth. On average, counties with high growth rates had low unemployment rates, also shown in *Table II-3*. Even those nonmetro counties with higher growth rates than metro counties (more than four percent), however, still had higher unemployment rates than the metro average.

Unemployment also shows a strong relationship to poverty. The wealthiest counties (those with 1980 per capita income above $8,509) had average unemployment rates of 8.9 percent and 8.5 percent in 1982 and 1985, while the poorest counties (those with per capita income below $5,415) had average unemployment rates of 13.7 percent and 12.0 percent for the two years. In 1985, unemployment levels were 55 percent higher in metro than nonmetro counties.

Tourism, Retirement, and Employment

Tourism is among the most highly touted development strategies for supplementing industrial recruitment. It is also among the most successful. The *Travel Industry World Yearbook*[3] asserts that tourism generates one out of every eight jobs. Even if that figure is inflated to boost the industry's position, tourism undoubtedly is an important factor in growth. It not only creates jobs but establishes a cultural and social environment that attracts other businesses. Further, the conditions that support tourism attract retirees as well as visitors. Chapter V includes a more detailed discussion of the role of tourism in the region's fastest growing counties.

The ability of a county to benefit from tourism depends on natural, historical, and social factors and its recreational and shopping facilities.[4] The first two can be developed but not created, while the last two can be created and developed.

Retirement Communities as Development Strategies

For many years. the South has drawn people of retirement age escaping the harsh winters and high costs of northern states. Interstate 95 has been one major winter evacuation route for snowbirds. Large numbers of Northeasterners made their way down the Atlantic coast, first for vacations and later to live, bringing with them in many instances sizable savings, transfer income, and skills. Much of the rapid growth of Florida's population is from retirees and refugees from the North.

Today,with the growing elderly population and even higher urban living expenses, more and more rural areas are beginning to recognize and act upon the economic potential of retirement residences. As Florida becomes more densely populated, retirees are stopping farther north, in Georgia and South Carolina. The *Wall Street Journal* recently featured Keowee Key, South Carolina, in a story about the economic potential of serving retirees. Keowee Key is near the town of Seneca in the northeastern Appalachian corner of the state, not too far from Clemson University and a large recreational lake. South Carolina's state government bought 3,000 acres near the Savannah River in 1986, expecting to develop the rural area and set up a retirement community for about 12,000 people.[5]

The Ozarks of Arkansas and the mountains of North Carolina also are large retirement areas in the South. In fact, all but three of the USDA's 146 "retirement" counties were in six SGPB states: Arkansas (34), Florida (27), Georgia (23), Virginia (23), North Carolina (18), and Oklahoma (16). Although data by county were not acquired for the analysis, the USDA classifies those counties with high rates of in-migration of adults aged 60 or over between 1970 and 1980. The economic activity in these "retirement" counties, shown in *Table III-4*, sheds some light on the economic value of serving the older population. The growth rate of the retirement counties, 3.4 percent, was about equal to the average growth rate of metropolitan counties. Income grew more than twice as fast as the nonmetro average, 5.1 percent.

Table III-4

Characteristics of USDA Retirement Counties in the Nonmetro South

Number of Counties	146
Annual Employment Growth, 1977-84	3.46
Annual Income Growth Rates, 1981-85	6.38
Per Capita Income, 1985	$8,715
Tourism Employment, percent of total, 1984	9.4

Tourism and Growth

Building on the mild climate, long sea coast, and the history of the region, many states are trying to attract more and more visitors in the hopes that they will spend money and create jobs. Although it is impossible to identify the precise impact of tourism, the success of certain industries is based on serving visitors—overnight accommodations, eating establishments, and automobile service stations. Disproportionate employment in these industries can be used as a reasonable proxy for tourism.

Is the size of the tourism-based economy a strong indicator of growth?

Job growth and per capita income are highest in those counties where more than 7.5 percent of the labor force is employed in tourism-related industries, as shown in *Table III-5*. The high per capita income could mean that incomes in these service industries are not as low as thought, but they could also mean that these areas attract wealthy residents that skew the average. Income growth is highest in the highest tourism counties, but it is also surprisingly high in the lowest category.

Table III-5

Growth and Relative Size of Tourism-Related Industries

Percent Employed in Tourism, 1984	Number of Counties	Annual Growth Rate of Jobs, 1977-84	Annual Growth Rate of PCI, 1981-85	Per Capita Income, 1985
<2.5	96	1.73	3.24	$6,839
2.5-5.0	277	1.59	1.85	7,041
5.0-7.5	210	1.38	2.35	7,742
7.5-10.0	114	2.16	2.56	8,388
>10.0	72	2.85	4.91	9,090

Is the growth of tourism-related employment related to the overall strength of the economy?

When the growth of tourism-related employment is analyzed, the relationship to job growth is very strong. Counties that increased tourism-related employment by more than 50 percent grew faster than the average metro county and grew more prosperous (see *Table III-6*). Counties that lost tourism-related employment lost total employment as well. This confirms the importance of tourism and the environmental conditions that lead to tourism.

Table III-6

Relationship Between Growth Tourism-Related Jobs and Growth of Total Jobs, 1977-84

Percent Growth in Tourism Jobs, 1977-84	Number of Counties	Annual Growth Rate of Jobs, 1977-84	Annual Growth Rate of PCI, 1981-85	Per Capita Income, 1985
>50	121	4.08	5.40	$8,362
25 to 50	158	2.23	3.26	8,226
0 to 25	226	1.66	1.84	7,764
-25 to 0	167	0.33	1.15	7,277
<-25	74	-0.93	2.27	6,974

Population and Growth

Is population growth associated with employment growth?

As one would expect, population growth and employment growth go hand-in-hand, though not at the same rates. Counties with low population growth (an average annual rate of less than 0.8 percent between 1970 and 1984) experienced annual employment growth of 1.02 percent between 1977 and 1984. Counties with high population growth (greater than 1.6 percent annually) showed employment growth of 2.90 percent, nearly three times as high as the slow-growth counties. Counties with highest population growth also showed the lowest unemployment rates in both 1982 and 1985.

Population growth shows a weaker association with poverty. Among the slowest growing counties, 83, or 29 percent, are classified by USDA as "persistent poverty" counties. Of the fastest growing counties, 52, or 23 percent, fall into this category.

Chapter Notes

[1] John Shelton Reed and Daniel Singal, *Regionalism and the South: Selected Papers of Rupert Vance* (Chapel Hill: University of North Carolina Press, 1982).

[2] George Rucker, *Rural Poverty in Perspective* (Washington, D.C.: The Rural Coalition, 1987.)

[3] Somerset R. Waters, *Travel Industry World Yearbook: The Big Picture-1986* (New York: Child & Waters, Inc., 1987).

[4] Paula Shea, *Tourism as a Tool for Economic Development: Evaluation and Effects* an unpublished departmental paper (Chapel Hill: University of North Carolina Department of City and Regional Planning, 1988).

[5] Bill Richards, "An Influx of Retirees Pumps New Vitality Into Distressed Towns," *Wall Street Journal* CCXII (August 5, 1988, p. 1).

Education & Technology

The keys to economic development 20 years ago, according to most developers, were location, location, and location. In the 1980s, the new keys according to most developers are education, education, and education. No one understood that new relationship better than the many young and dynamic governors in the South who came onto the scene in the late 1970s. Their new and wide-ranging reforms of education in fact preceded even the heralded release of *A Nation at Risk*. The new programs of Governor William Winter in Mississippi, Governor Dick Riley in South Carolina, Governor Lamar Alexander in Tennessee, Governor James Hunt in North Carolina, and others were already well underway in 1983. Southern governors valued the social imperatives of better and more equitable education as well as the economic benefits, but they were pragmatic enough to sell their programs on the basis of the economic value to business and to the states.

And indeed, education has remained on the front burner in all of the SGPB states, linked more closely than ever to economic vitality and capacity. The recent decline in the economic fortunes of southern rural counties can be attributed at least in part to past neglect of and underinvestment in education. The analysis of *ATF* and Chapter I of this report demonstrate that growth is associated with increasing levels of educational attainment. This stands in contrast to the not-so-distant past, when most jobs could be learned readily on the job and when too few businesses valued education.

Today's work requires greater knowledge and higher-order skills prior to on-the-job training. That is the presumption driving many of the educational reforms in the South. And it was indeed born out by the survey of manufacturers reported in *Reviving the Rural Factory: Automation and Work in the South*. Increased use of advanced technologies in the workplace requires proportionally more scientists, engineers, and technicians and an educational system from the elementary schools through the research universities that values and is proficient in scientific inquiry and innovation. Further, good schools are more important in attracting and keeping a well-educated work force. According to director of South Carolina's Development Board, some new businesses considering locations within the state ask not only about the quality of education generally but insist on examining test score data.

The new attitudes of business toward human resources are summed up in the latest analyses of states' climates for business activity. Under the old rural industrial recruitment framework, the main connections between site selection and education and training were the availability of an acquiescent and hard-working labor force and vocational education. Few businesses today, however, take such a narrow and short-sighted view. New demands for higher-order skills and knowledge lead business executives to give more weight to availability and quality of both educational institutions and the local labor force when choosing sites in which to expand or invest.

The factors that now influence business decisions and economic activity are captured by the indices developed by the Corporation for Enterprise Development[1] and SRI International.[2] They include many proxies for the skills and knowledge of the work force: years of educational attainment, size of the technical work force, number of graduate degrees granted, and level of research and development activity. One drawback to the application of business climate indices, however, is that they are based on state averages. Most business decisions take into account local human resources; differences among counties within states are greater than differences among state averages. What then are the implications for the economic future of nonmetro counties in the South, which on average have lower levels of educational attainment

and expenditures and a proportionally smaller technically trained work force than metro counties, as shown in *Table IV-1*.

Table IV-1

Educational Characteristics of Counties in 1980, Percent

			Nonmetro		
	Metro	Nonmetro	High 25%	Low 25%	Lost Employment
Adult Illiteracy	17.6	30.8	28.2	34.4	35.6
High School Completion	64.7	48.6	45.4	45.5	44.3
College Completion	16.6	9.4	10.3	8.1	7.7
Scientists, Engineers	3.2	1.6	1.6	1.5	1.5
College Location	45.6	14.3	16.7	8.3	7.1

Note: High 25% is the quartile composed of counties with the highest job growth and the Low 25% is the quartile composed of counties with the slowest job growth.

Educational Characteristics of Counties in 1980

This section examines the relationships between employment changes and unemployment rates and educational measures that represent the skill levels of the labor force, the educational infrastructure of the area, or the ability to support advances in technology and innovation. The measures are:

- Levels of education attainment (less than eight years as a proxy for adult functional illiteracy, high school, and college);
- Location of four-year colleges and research universities;
- Number of scientists, engineers, and technicians residing in the county; and
- Number of technical associate degrees granted (data for seven states only).

One might expect to find, based on existing notions of skill requirements for work, faster employment growth in nonmetro counties with higher educational levels and counties that have colleges or universities. In addition, as "high tech" industries grow rapidly and traditional industries continue to grow slowly or decline, one might expect to find more rapid employment growth in counti whose labor force is more credentialed for technical occupations.

Levels of Educational Attainment

ATF documents the scale of the differences between the populations of metro and nonmetro counties in educational attainment based on 1980 census data. These differences are larger in the South than in any other region, shown in *Table IV-1*. For instance, in 1980 about 50 percent of all adults over 25 in nonmetro counties had completed high school, while in metro counties about 65 percent of all adults fell into that category. In other regions, metro/nonmetro differences were much smaller, and in the Northeast nonmetro high school graduation rates actually are higher than metro rates.

Table IV-2

Percent of Population Aged 15 and Over Completing High School and College, 1980, by Urban-Rural Residency and by Region

Region	*High School*		*College*	
	Urban	Rural	Urban	Rural
Northeast	64.5	64.7	15.1	12.8
North Central	66.1	61.6	13.8	8.2
South	62.7	48.5	14.8	7.2
West	70.1	65.5	15.7	11.8
United States	65.7	56.4	14.8	8.8

The large differences in educational attainment existing in the rural South in part reflect the racial composition of the adult population, the past low quality of education available, and migration patterns. Historically, the poorest education and highest dropout rates have been in the rural South, both in black communities which lacked access to better schools, and in Appalachian communities, which also were too poor and powerless to have good schools. The older and less educated rural blacks who were denied quality education until recent years moved into the cities of the North where they hoped for more opportunities. Similarly, rural poor and undereducated Appalachian whites moved into the cities of the North in search of job opportunities. The fact that the poorest and less educated segments of the nation settled either in the cities in the North or remained in rural communities in the South in part explains the greater metro-nonmetro disparities in the South than elsewhere.

Do high rates of adult illiteracy (defined as percentage of adults with less than eight years of education) constrain employment and income growth?

Much of the attention to adult literacy in the states in the last few years has been a result of changes in the workplace. Adults without the ability to read, communicate, and use numbers with reasonably high levels of competence simply are not able to qualify for many of the new jobs. Although most all people can read and are not considered illiterate by international standards, a large number cannot read, write, add, or subtract well enough to function in a modern society or workplace. This is referred to as functional illiteracy and is often measured as someone who performs at less than the fifth grade level. Fifth grade achievement, however, is only a relative standard. Some children reach that level before fifth grade, and some adults had not reached it even when they completed high school. It is generally assumed that anyone who dropped out of school before ninth grade probably was achieving at much lower levels, and, therefore, the figure provided by the U.S. census for the number of adults with less than eight years of education is the most widely used proxy for adult illiteracy.

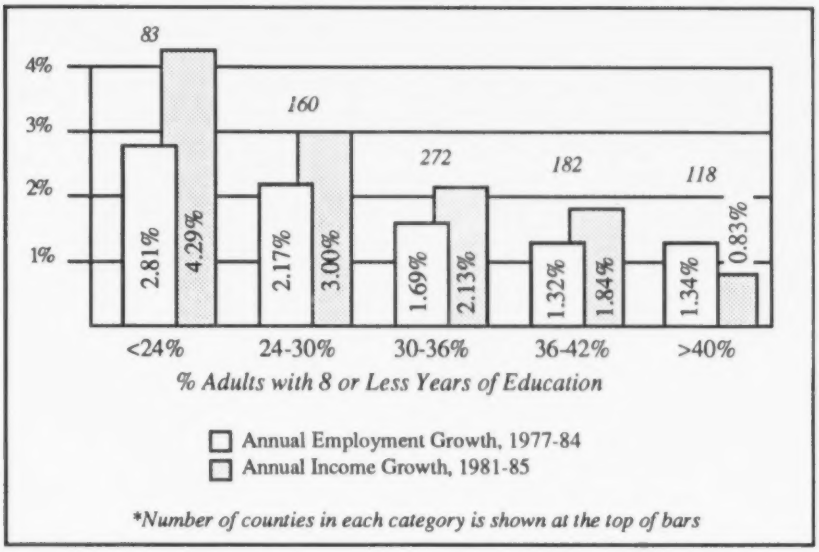
One ray of hope is the fact that the data on educational attainment were collected during the 1980 census, and because the highest rates of illiteracy are among the oldest segment of the population, the true number of functional illiterate adults today is certainly quite a bit lower. In the rural South, for example, the proportion of adults aged 15 and over with less than eight years of education is 31 percent. If only adults between 15 and 59 years of age are included, however, the proportion drops to 17 percent. Yet the relative differences among counties changes very

slowly, and the relationships between growth and educational attainment are meaningful for policy analysis.

The 83 nonmetro counties in the South with the lowest adult illiteracy rates grew more than twice as fast (2.81 percent annually) as the 118 counties with highest illiteracy rates (1.34 percent annually), as shown in *Figure IV-1*. Further, unemployment rates were directly associated with adult illiteracy rates, shown in *Figure IV-2*. And, lastly, both income and income growth were directly related to rates of adult illiteracy, also shown in *Figure IV-1*.

Figure IV-1

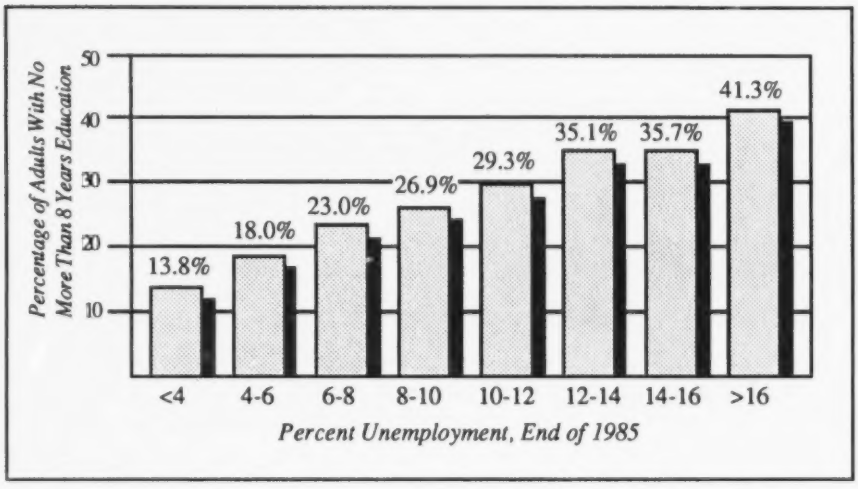
Rates of Adult Literacy and Job and Income Growth in the South



Lack of formal education had even more dramatic effects on income and income growth rates. The per capita income in counties with low levels of adult functional illiteracy was nearly one-half again as high as the per capita income in counties with the highest levels. Further, the disparities are growing. The rate of growth in per capita income in counties where more than 42 percent of adults had not gone beyond eighth grade was less than one-fifth of the per capita income growth in counties where less than 24 percent were functionally illiterate. This suggests widening gaps in the region in per capita income and growing poverty because growth rates are below the rate of consumer price inflation. There also is a clear association between education levels and poverty. Nearly one-half of all counties with an illiteracy rate greater than 42 percent have been classified as "persistent poverty" counties by USDA.

Figure IV-2

Unemployment and Illiteracy, SGPB South



Source: Southern Growth Policies Board, 1988

How do proportions of high school and college graduates among the adult population of a county affect rates of employment growth?

Higher levels of attainment, high school completion and college graduation yield relationships to employment growth similar to those found for functional illiteracy. The counties where more than 60 percent of adults had completed high school grew more than twice as fast as the counties where less than 40 percent of adults had completed high school. Counties where over 11 percent of adults have completed college grew almost twice as fast as those in which less than seven percent of adults have completed college.

Table IV-3

Adult Illiteracy Rates and Changes in Employment and Income

% Adults with Less than 8 Years of Education or Less	Number of Counties	Annual Employment Growth, 1977-84	Annual Income Growth, 1980-85	Per Capita Income 1985
< 24	83	2.81	3.43	$9,245
24-30	160	2.17	2.40	8,122
30-36	272	1.69	1.70	7,678
36-42	182	1.32	1.47	7,141
> 42	118	1.34	0.66	6,466

As noted, however, the metro-nonmetro difference in education levels is much greater than differences among nonmetro counties. Even the nonmetro counties with the highest rates of high school and college completion (greater than 60 percent and 11 percent respectively, as shown in *Figures IV-3* and *IV-4*) compare unfavorably to the metro average completion rates of 65 percent and 17 percent, respectively. And the employment growth rates for the nonmetro counties with the highest education levels are still well below the average rate of employment growth in the metro South.

Figure IV-3

High School Completion Rates and Job Growth in the South, 1977-84

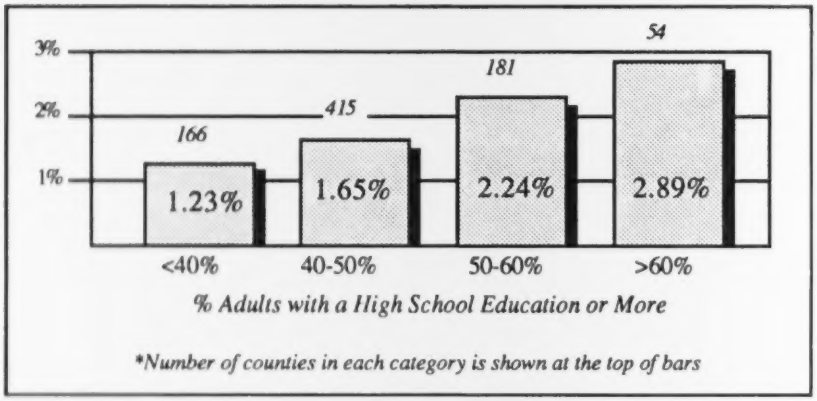
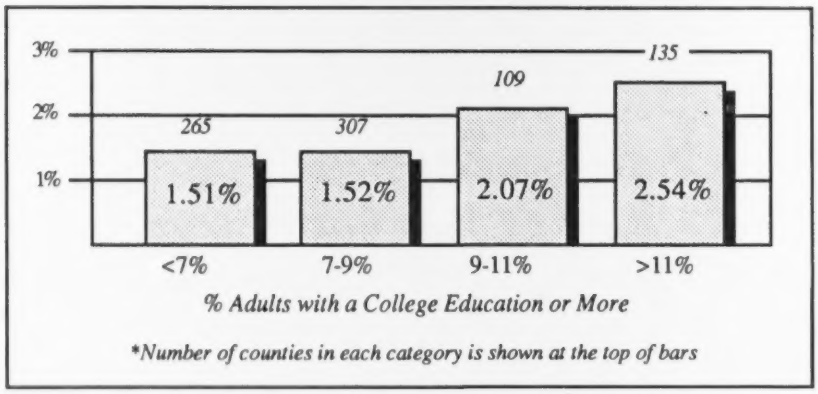


Figure IV-4

College Completion Rates and Job Growth in the South, 1977-84



Is the effect of educational attainment independent of or an artifact of some other factor?

Although the three levels of education attainment are analyzed separately, there is a strong interdependency, and counties with low levels of eighth grade attainment tend also to have low levels of high school and college graduation rates. Of the 581 nonmetro counties with below-average proportions of high school graduates, 85 percent also have below-average college education levels and 89 percent have above-average illiteracy rates. There are 93 counties with the puzzling profile of a high illiteracy rate coupled with a high level of college graduates. In about one-half of these cases, the puzzle can be explained by either the presence of a college or university (26 counties) or high retirement population (21 counties). Therefore, it is difficult to judge the effect of one or another, and perhaps not really important. This study is really only trying to establish the importance of educational attainment to job and income growth. The real issue is whether the general educational attainment within the county or labor market area affects changes in the level and quality of employment.

The question might properly be raised whether education plays a role in employment growth or whether the effects are really the result of some other factor that is related to educational attainment, such as wealth or race. An analysis of farm belt state nonmetro employment by the National Governors' Association concluded that rates of high school completion did not independently influence employment growth.[3] That study combined the three measures of adult literacy, high school completion, and college completion, and inserted the education factor into an analysis with other factors (shown in Appendix E). The result was that, independent of other factors such as race, ruralness, location, volume, infrastructure, and industrial mix, levels of educational attainment did have a statistically significant influence on growth.

Location of Colleges and Universities

Research universities and four-year colleges are much more likely to be located near centers of population in or near cities than in nonmetro counties. In the South, 13 percent of nonmetro counties (105) have four-year colleges, and two percent (15) have Ph.D.-granting universities, including three counties with both types of institutions. These can be compared to the 40 percent of metro counties (109) that have four-year colleges, and 18 percent (48) with Ph.D.-granting universities, including 33 counties that have both. When college enrollment is adjusted for population, however, nonmetro and metro counties show a virtually equal per capita level of four-year college enrollment: 127 per 10,000 in nonmetro counties and 124 per 10,000 in metro counties. Enrollment in universities remains much higher in metro counties even when population is taken into account: 88 per 10,000 population for nonmetro counties and 191 per 10,000 for metro counties.

Does the presence of a college or university in a county affect employment growth?

Average annual growth rates for counties with and without higher education institutions were 2.4 percent and 1.8 percent, respectively. One might expect the impact of a college or university to be greatest in *remote* counties, where such an institution, if present, is likely to be a dominant player in the local economy. The difference in employment growth between counties with and without a higher education institution is indeed greater in *remote* counties than in nonmetro counties as a whole—1.7 percent for *remote* counties without a college or university and 2.6 percent for *remote* counties with a college or university.

Absolute size of a college or university, not relative to population, shows the strongest relationship to its county's growth rate. Counties with small colleges (less than 500 students) actually grew at a slower rate than counties with no college. Counties with middle-sized colleges grew at a slightly higher rate, and those with large colleges (more than 2,000 students)

grew at a much higher rate, perhaps because of increased enrollment levels. Universities exhibit the same pattern. However, the growth model in Chapter I shows that colleges alone retain their growth effects even after other factors are introduced. Put simply, colleges are significant in stimulating growth, all other things being equal, but universities are not.

Technology and Growth

Closely related to education are the technical resources a county has to support the growing number of businesses that need higher levels of technical skills. The new business climate indicators that now include educational measures also include new measures of a county's technological infrastructure—its scientists, engineers, and technicians, various measures of technical degrees granted, and measures of R&D (research and development). Of those measures, the first, which represents the locally available technical labor force, and the associate degrees granted technicians, which represent local capacity to support technologically dependent businesses, are most important at the county level. In addition, because high-tech businesses tend to concentrate and attract others, the size of the labor force employed in high-tech businesses may be a factor in a county's growth.

Technical Employment

As businesses and industries become more dependent on technological advances and as they adopt more sophisticated equipment in the workplace, the need for technically and scientifically trained workers increases. In a survey on automation conducted among manufacturers in the rural South, more than one-half of the respondents noted that automation increased the number of people employed with technical degrees; not one noted a decrease. In aggregate terms, the U.S. Bureau of Labor Statistics projects a rapid increase in the demand for technicians by the year 2000 even as overall manufacturing employment is projected to decline.

It is impossible to know whether businesses expand as a result of the availability of a technically trained labor force (TLF) or whether they attract technicians and scientists to areas in which they have decided to locate for reasons unrelated to technical labor force availability. Yet, the association between higher proportions of technicians and growth is important to state policy. Most evidence, in fact, suggests that professionals (scientists and engineers) are quite mobile and will move to job locations but can afford to be choosy in their selections and rule out job opportunities that do not meet their own or their families' needs.

Occupational information for counties is based on 1980 place of residence data, not place of work, and a county with a large number of technicians who commute to work in a neighboring county would not necessarily show a high rate of employment growth, even if the industry in the neighboring county were growing rapidly. The occupational classifications that comprise this factor are listed in Appendix F.

Although the number of people employed in science and technology related occupations are quite small relative to the work force, the concentration of TLF is twice as high in metro counties (3.2 percent) as in nonmetro counties (1.6 percent). There is also a slightly higher concentration of technical jobs in *adjacent/corridor* and *corridor* counties. These counties have an average of 1.8 percent of their labor force working in technical occupations, compared to 1.3 percent and 1.4 percents in *remote* and *tier* counties.

Given the limitations of the analysis, can anything be learned about the impact of percentages of scientists, engineers, and technicians on the nonmetro economy?

Table IV-4

Technical Labor Force and Economic Growth in SGPB South

% of Labor Force Employed as Scientists, Engineers or Technicians, 1980	Number of Counties	Annual % Employment Growth 1977-84			Income		% Counties with College or University
		Total	Manufacturing	Services	Annual Growth 1981-85	Per Capita Income 1985	
<0.5	46	1.77	1.80	1.75	0.64	$6293	6.5
0.5-1	161	1.56	1.03	2.26	1.24	6838	10.6
1-1.5	251	1.90	0.74	3.06	2.65	7623	12.4
1.5-2	177	2.13	0.46	3.50	2.36	8032	16.4
2-3	114	2.05	-0.13	3.47	3.51	8403	21.1
>3	48	1.89	0.22	3.61	3.97	9202	25.0

How does employment growth vary with relative size of technical work force?

On the basis of simple relationships, employment does not appear to be affected by the relative size of the TLF, described in *Table IV-4*. The annual employment growth rates between 1977-1984 for nonmetro counties with varying proportions of technical workers were not statistically different from one another.

Employment in manufacturing, however, varies inversely with proportions of technicians. Higher proportions of technically trained workers are associated with slower growth in manufacturing. The relationship is even stronger when limiting the TLF to males, who are most likely to be engaged in manufacturing. This suggests that manufacturing in the rural South does not yet employ large numbers of technicians or engineers and, as noted in *Reviving the Rural Factory*, new process technologies have made few inroads into southern rural manufacturing.

There is a strong association between the relative size of the TLF and the relative importance of high-tech industries in the counties' economies. Where the TLF was less than one-half percent, the percent of employment in high tech industries was less than one percent; where the percent TLF was higher than two percent, the percent of employment in high-tech industries was about six percent. Because one measure used to define "high-tech industries" is the scale of employment of a technical work force, this measure is only of cursory interest.

Employment in service industries, on the other hand, increased with the size of the TLF. Counties with the highest relative levels of technically trained employees grew the slowest. As the proportion of scientific workers increased, the probability of a four-year college or university in the county also increased, from 6.5 percent at the low end to 25 percent at the high end.

Is income higher and does it grow faster in counties with higher proportions of people with technical skills?

Per capita income in 1985 and the rate of growth of income between 1980 and 1985 is positively associated with the relative size of the technical labor force. Per capita income in the counties with more than three percent of their labor force in technical occupations was nearly 50 percent higher than counties with less than one-half percent, and the growth in per capita income was about six times as great. It is impossible to say, however, whether the association is due to the effects of high pay scales in technical labor markets or to a proclivity of technical and scientific workers to live near other more affluent and educated people.

Technical Training

The most recent occupational projections of the Bureau of Labor Statistics show rapid increases in the demand for technicians. Although many technicians in the past have had only high school degrees, the two-year associate of science degree is fast becoming a requirement for entry-level technicians. It is generally assumed that technicians, most of whom obtained their education near their homes, are less geographically mobile than professionals, and therefore the availability of technical training is a factor in new job growth. Further, many state development efforts are based on the assumption that technical or community colleges are factors that influence business location.

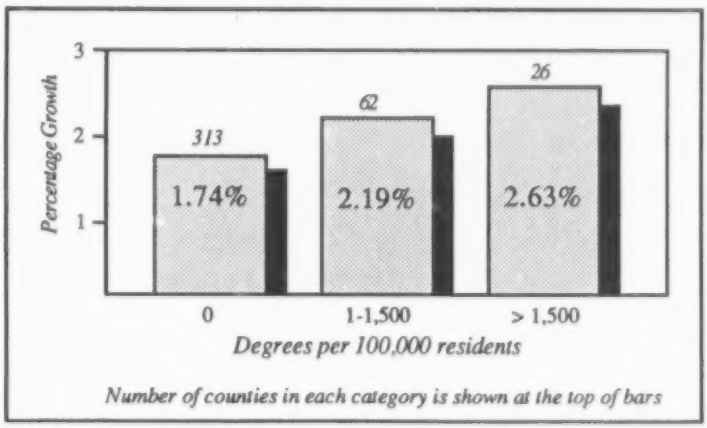
How important is a fresh supply of technically-skilled workers in determining a county's employment growth rate?

Data on technical college enrollment in seven states indicate that the number of technical associate degrees is strongly associated with employment growth. Data were analyzed on enrollment in technical degree programs at technical colleges in Alabama, Arkansas, Florida, Mississippi, North Carolina, South Carolina, and Tennessee. These states resemble the 12-state region in overall employment growth and education levels. They have slightly lower per capita income and higher 1982 unemployment rates. They also have a somewhat lower college and university enrollment per capita than the region but have a comparable level of technical employment.

Of the 401 nonmetro counties in these states, 88 (22 percent) have technical colleges that offer training for technical occupations. In those 88 counties, average technical enrollment is 623, or 136 per 10,000 population. Nineteen of these counties also house a college or university.

Figure IV-5

Annual Employment Growth Rates, 1977-84, and Technical Associate Degrees per 100,000 Residents, Nonmetro SGPB Counties



One would expect the counties with technical training facilities to have above-average proportions of their labor force working in technical occupations. This is true, but there seems to be a critical mass that must be reached before an effect occurs. Counties with high absolute

numbers of technical enrollment (greater than 1,000 students) and those with high enrollment levels per capita have relatively high proportions of workers in technical occupations. But the counties with low to moderate technical enrollment per capita have no more technical workers than the counties that lack technical training facilities altogether.

Employment in High-Tech Industries

To offset the decline in employment in traditional manufacturing, many economic developers are seeking high-tech industries. Assuming that high-tech businesses have greater potential for growth and higher-paying jobs and that they are more likely to cluster and attract other high-tech firms, states and local development officials often are willing to offer greater incentives and assume greater risks. Critics, however, point to evidence that many of the production facilities of the industries often classified as high-tech are no more stable than the traditional industries, that the work is no more demanding and higher paying than jobs in traditional production, and that total expected employment in high-tech industries is too small to have a significant impact on the rural economy.

Much of the controversy is caused by the schemes used to classify firms as high-tech. For lack of a better definition, high-tech industries generally are classified according to (a) the proportion of their work force that is technically trained and/or (b) the percentage of revenues spent on R&D (research and development). Using those two measures, the 100 three-digit industries with the highest investments in R&D and highest employment of technically trained workers were classified as "high-tech" (Appendix G) and employment levels of those 100 industries used as the proxy for high-tech employment for each county.[4] The average for high-tech employment as a percent of total employment in the nonmetro South in 1982 was 6.2 percent, and the average proportion of rural manufacturing that is classified as high-tech is 15.5 percent.

While that definition probably accurately reflects the employment of an independent firm, it may have little to do with the mix of employment in a branch plant of a large corporation. The production could be, and usually is, carried out far from the R&D facilities and may in fact have little to do with new process technologies. Yet the distinction does provide some indication of where industries are locating which conduct more R&D and employ more technicians,

Table IV-5

High Tech Manufacturing as Percent of all Manufacturing and Growth

Manufacturing, Percent High-tech	Number of Counties	Annual Employment Growth Rate, 1977-84	Annual PCI Growth Rate	Per Capita Income, 1985
>30	104	2.12	2.74	$8311
20-30	65	1.95	2.38	8001
10-20	94	2.09	2.84	8088
0-10	303	1.93	2.61	7800
0	250	1.48	2.27	7086

and, thus, are likely to be more dynamic. In the South, that choice is predominantly in the cities. Nearly twice as many of the manufacturing jobs located in metro counties (more than one in four) are designated high-tech while only a little more than one out of seven nonmetro manufacturing employment is high tech.

Does the relative scale of employment in high-tech industries influence growth or income?

The proportion of the manufacturing work force that is employed in the high-tech industries has no apparent effect on overall job growth in nonmetro counties, as shown in *Table IV-5* on page 51. This seems to suggest, as skeptics of the growth potential of high-tech production claim, that in nonmetro counties the presence of high-tech branch plants has no greater effect on the county's economy than a traditional industry's plant. Of the 816 nonmetro counties, however, 252 have absolutely no high-tech jobs using the classification mentioned. Note, however, that per capita income does rise with high-tech employment.

Chapter Notes

[1] *Making the Grade* (Washington, D.C.: Corporation for Enterprise Development, 1988).

[2] AmeriTrust, *Indicators of Economic Capacity*, 1986.

[3] DeWitt John, Sandra Batie, and Kim Norris, *A Brighter Future for Rural America* (Washington, DC: National Governors' Association, 1988).

[4] Classification scheme used in Glasmeier, 1987. The 1982 data were obtained from Amy Glasmeier, University of Texas.

Winners, Losers, & Surprises

In every category of counties there are "outliers"—counties that grew much faster or slower than one might expect based on their infrastructure, economic conditions, and resources. A simple comparison of the 25 percent of the counties that grew the most and the 25 percent that grew the least is shown in *Table V-1*. The aggregate statistics for groupings of counties, however, paint a picture of jobs and income in the nonmetro South with a broad brush. Sometimes, however, more detail is desirable by zeroing in on counties that performed unusually well or poorly to better understand their specific circumstances. The most fruitful detail comes from the outliers: (1) those rural counties that managed to beat the odds and grow much faster than most southern cities; (2) those that gained large numbers of new manufacturing jobs; (3) those counties that either grew much more slowly than the nonmetro average or declined; and (4) those counties that grew much faster than would have been predicted by the regression model based on their demographic and industrial composition.

It is not always easy to understand or explain high growth in small counties. Because the labor markets are so small, the success or failure of just one large business can move a small county into one of the outlier groups. Despite their small population bases, it is useful to look more closely at the characteristics of these counties on an individual basis and to draw on the knowledge of those who work within the various states and counties to find out more about the microeconomics of local development.

Table V-1

Profile: Nonmetro Counties, High and Low Job Growth

	Slowest 25%	Fastest 25%
Human Resources		
Eight years of education or less, % of Adults	35.20	29.46
Four years of High School, % of Adults	45.35	51.25
Four years of College, % of Adults	8.06	10.29
Technical Work Force, % of Total Labor Force	1.52	1.63
Population and Income		
Population Annual Growth Rate, 1980-1985	0.33	1.84
Blacks, % of Total Population	21.94	17.01
Per Capita Income, 1985	$7,319	$8,304
PCI Annual Growth Rate, 1981-85	0.90	4.76
Economy		
Manufacturing, % of Total Employment, 1984	31.90	27.87
High-Tech Manufacturing, % of Manufacturing, 1982	14.35	18.04
Tourism, % of Total Employment, 1984	5.45	7.53
Unemployment Rate, 1985	11.62	8.68

Growth in the Fast Lane of the Nonmetro South

Many nonmetro counties grew faster than even the metro average for the years 1977-1984. Thirty-eight nonmetro counties increased their numbers of jobs by more than 50 percent between 1977 and 1984. What accounted for the rapid growth of these counties? A combination of analyses of the geographic locations of the counties and telephone discussions with county commissioners sheds some light on these outliers. Many of these conditions are not easily quantifiable and cannot be found in empirical models, but they may be detected by systematically examining qualitative evidence. There were surprises in the locational patterns. It was mildly surprising, for example, that more of the highest growth nonmetro counties were not expansions of the high-profile, high population, high-tech centers of the South such as Atlanta, Research Triangle Park, or Nashville. For example, the highest rates of nonmetro growth in North Carolina were in the extreme eastern and western parts of the state, not near the notable "high-tech" crescent, which extends from Charlotte to Raleigh.

Instead, a large number of the high-growth counties are located in counties that have major tourist attractions: coast lines, recreational lakes, scenic mountains, even ski resorts. Another group draws on some special economic entity within the county or near the county, such as a military installation. A third group has grown by capturing the overflow of some growing metro counties—as bedroom communities but with a growing consumer service sector and new industries. Last, some counties have grown due to much more intangible factors—the pull of a strong state economy and the dynamics of aggressive and innovative leadership.

Of the 38 counties whose employment grew more than 50 percent from 1977 to 1984:

- Thirteen are located along the Atlantic coast;
- Twelve include parts of major recreational areas;
- Thirteen are what the USDA designates as "retirement" counties;
- Twenty-one are adjacent to a metropolitan center and at least four seem to be benefiting directly from the spillover of growing metro industrial centers;
- Twenty-two are located in eastern seaboard states;
- Twelve have concentrations on minority populations greater than the southern nonmetro average;
- Eight counties had more than 10 percent of their work forces employed in tourism-related industries;
- Seven have more than three out of eight workers employed in manufacturing; and
- Ten of the fast growing counties are USDA-designated agriculture counties.

Recreation and Retirement

Perhaps the most important ingredients of growth are the physical and recreational attractions a county can offer. One of the conclusions of *ATF* was that the more mobile and highly educated work force of many of the emerging industries are more selective, and that they are more likely to take into account the physical and cultural amenities of an area as well as the traditional cost factors. The counties that experienced rapid growth seem to bear that out.

Nearly all of the very high growth counties had substantial shoreline along the Atlantic coast or recreational lakes, were in the mountains, or included national forest recreation areas. These counties draw both tourism and retirees. White County in the Blue Ridge mountains of northern Georgia, for example, is the home of the state government conference center and employs one out of 10 workers in tourism-related industries. Marion County in northern Arkansas in the Ozarks and Macon County in the Blue Ridge Mountains of North Carolina offer desirable low-cost, retirement communities. Charlotte County, Florida, is on the coast adjacent to Fort

Myers. Horry County in South Carolina, with more than 100,000 residents though still categorized as nonmetro, includes the major resort area of Myrtle Beach and a technical college that features tourism as its focus. One out of five workers there are employed in tourism-related businesses. The economy of Murray County, Oklahoma, has been propelled by its lake resorts and the success of the Arbuckle Wilderness Park. Virginia's Nelson County was boosted by the success of Wintergreen ski resort and the timeshare homes that have developed in and around the mountain.

In North Carolina's Dare, Hyde, and Carteret counties along the coast, employment grew by leaps and bounds. By summer 1988, Dare County's unemployment rate had dropped to 1.5 percent, second only to Currituck, another coastal county, and lower than any metro county in the state. The growth in population (from 7,000 in 1970 to 22,000 projected for 1990) and jobs has been attributed nearly exclusively to tourism. The state's division of travel and tourism estimates that two out of every five jobs in the state were related to tourism in 1985.

Metro Explosions

The one growth that nearly everyone expects to observe is the overflow from large growing metro centers. State maps do indeed reveal that some of these are spawning new nonmetro growth. The Virginia outskirts of Washington, D.C., the corridor between Lexington, Kentucky and Cincinnati, Ohio, and the area near Huntsville, Alabama each presumably generated at least one very high growth nonmetro county. According to surveys, a sizable portion of the population want the high incomes and job opportunities a city can offer but prefer to live in a smaller community. Many are willing to exchange relatively long commutes for a slower-paced rural setting, and residence creates jobs in consumer services. Clarke County, Virginia, is close enough to Washington, D.C. to draw commuters but still retain its nonmetro status. Trimble County, Kentucky, between Louisville and Cincinnati, and Wilkinson County, Georgia, near Macon, also fit that description. These counties, however, could become metro, which once again would alter employment patterns that distinguish between metro and nonmetro.

Special Circumstances

Sometimes high growth rates in counties that have no apparent sources of growth can be explained by some special resource or circumstance. Besides being on the Atlantic coast, Bryan and Camden Counties in Georgia, and Jones County, North Carolina, for example, have military bases that bring income into the county. Appling County, Georgia, has a Georgia Power Nuclear Facility, which employs a large number of people. Atkinson County has strong local leadership and was able to attract sizable federal community development block grants.

Four of the nonmetro high-growth counties are home to large colleges or universities. Flagler County, Florida has a relatively large aeronautical college that may account for part of its growth. Rockland County, Virginia includes the city of Lexington and both Virginia Military Institute and Washington and Lee University. Although the colleges are located within the city boundaries, many of the jobs they generate are in the surrounding county. Nelson County has no university, but benefits directly from the University of Virginia in adjoining Albemarle County. With skyrocketing living costs in the Charlottesville area and local government constraints on growth to maintain the scale and protect the environment of the city, many of the jobs and people have moved across the county line.

Strength of State's Economy and Development Strategies and Leadership

Last, the presence of high growth counties may be influenced by the economic vitality of the state in which they are located. Twenty-four of the 38 counties are located in the four eastern states of Virginia, North Carolina, Georgia, and Florida, each of which has strong metropolitan centers with highly-regarded universities, airline hubs, and other amenities that have helped to attract large numbers of people and jobs. These states have had the highest overall rates of growth in the region.

Bucking the Trend with Manufacturing Growth

There were also counties that managed to add new manufacturing jobs between 1977 and 1984, during a period when manufacturing employment in the nation was barely holding its own. Averages can hide major restructuring among plant locations and industries within the region and within states. There were counties that were big winners—counties that added large numbers of jobs in manufacturing. It is useful to look more closely at these counties to see if there are any lessons to be learned from their experiences and histories of these counties.

To avoid being misled by counties that exhibited large percentage increases because the base was so small in 1977 (which also introduces large estimating errors), the cohort of nonmetro, high growth counties was restricted to the 419 that had a higher-than-average concentration of employment in manufacturing in 1984—more than 30 percent. Of these, 49 counties increased their manufacturing employment by more than 50 percent between 1977 and 1984. What is the profile of these counties, and what can be learned from their successes?

First, high manufacturing growth is spread more evenly across the region and not as heavily concentrated in the eastern seaboard as high total job growth. Of the 49 high-growth manufacturing counties, five are in Alabama and Mississippi and eight are in Kentucky and Tennessee.

Second, many of the counties attracting industry jobs had large minority populations. In one-half of the manufacturing growth counties, at least 30 percent of the population is black, which contradicts the notion that manufacturing will not locate in heavily minority counties. On the other hand, the contradiction of high unemployment and low per capita income along with growth suggests that the good jobs may be going to those outside the county.

Third, the locations of the counties that did well are somewhat surprising. Nearly one-half of the counties that gained the greatest proportions of manufacturing jobs are remote rather than along interstates or near urban areas. Among the five nonmetro county locations, manufacturing growth was greatest in the *remote* category. Further, much of the manufacturing growth is occurring in USDA agriculture-intensive counties (17 counties, or 35 percent), particularly in Georgia and Arkansas. The shift from agriculture to industry is continuing and possibly even accelerating. In many counties, particularly in Arkansas, much of that growth is coming from the poultry industries. Yell County, Arkansas more than doubled its employment in food processing, and in 1984 it accounted for more than one-half of the jobs in the county—although it had one fewer food processing company. Duplin County, North Carolina has a large, growing turkey processing business. Part of the reason for the high growth in remote counties is that some corporations continue to seek sites with low taxes, low wages, and low-educational levels compete on the basis of labor costs—possibly because they have a market niche not yet facing international competition. The growth in the upper Cumberland district of Tennessee is one example. Clay and Fentress counties continued to attract jobs in the apparel industries despite—or because—of low costs of doing business. Only one-third of the two counties' adults had completed high school, and per capita income was less than two-thirds of the state's average.

Lastly, in manufacturing perhaps more than any other kind of growth, aggressive leadership is a factor. Development still is viewed as being able to reel in a new plant, and even though the chances to land a large employer are dimmer, leadership combined with low costs are factors in success. Hoke County, North Carolina is an example of a county whose success has been attributed to local leadership and vision. Augusta County, Virginia also combined aggressive leadership and low land prices to attract industry. The county was willing to convert agricultural land for development purposes with few prohibitions on use, and it worked. They drew a major branch of the Hershey Chocolate Company, among others. Similarly, Frederick County, Virginia is more aggressive and more open to developers' proposals than counties closer to Washington, D.C. or the Shenandoah resort areas and therefore has drawn more businesses. The county offers the advantages of easy access to recreation and to D.C. (70 miles away) but strong support for development.

Slow Growth, Losing Ground

The counties that did not perform well also can shed some light on conditions needed to sustain growth. The profile of counties that lost a significant number of jobs between 1977-1984 (at least 10 percent) is quite different. Although 11 of the 45 counties in this group are in the states that grew quite fast—Florida, Virginia, North Carolina, and Georgia—they tend to be in western sections of the states, not near the coast. A large number are near national forests or other recreational areas but still haven't been able to reap major benefits.

There were some anomalies. For example, Martinsville County, Virginia lost jobs but had only a seven percent unemployment rate and a per capita income that was above the national average. Radford and Waynesboro counties in Virginia also had relatively low unemployment and high income despite the loss of jobs.

Of the 45 counties that lost the largest proportion of their jobs:

- One-third (15) are farming-intensive counties;
- Twelve, or 27 percent have been in the lowest quintile of poverty in the nation for 20 years or more;
- In 17, or 38 percent, more than one-third of the residents are members of a minority;
- Twenty-three, or just over one-half, had per capita incomes of less than $7,000 in 1984; and
- Twenty-seven, or 60 percent, had unemployment rates of more than 10 percent at the end of 1985.

The decline of employment in traditional farming counties follows national patterns. A decade or so ago these counties might have attracted new factories. But with the growing competition and facilities available in many manufacturing counties, agriculture counties are not able to easily adjust their economies.

Unanticipated Growth

The last group of counties to be examined are those that performed better (either grew more or declined less) than would be expected based on the multiple regression model. The 40 counties that exceeded their expected growth based on the economic model by the largest percentage were selected for investigation. Of those that grew more than expected (rather than declining less), the appearance of remote counties is again a surprise. More than 42 percent of these 40 counties were *remote*. However growth in jobs did not always result in increased per capita income.

- In 12 of the 40 counties, the 1985 per capita income was less than it was in 1981;

- In 35 out of 40 counties 1985 per capita income was less in constant dollars than it was in 1981;
- One-fourth of the 40 were designated as "persistent poverty" counties; and
- Ten are more than 30 percent minority.

North Carolina had the largest number of counties in this group, eight. Most were in the central Piedmont region. According to officials with the state association of county commissioners, part of that growth can be explained by spillover from the Research Triangle. There has been a conscious effort to create a "Triangle East" to better balance growth. In addition, some of these counties have very aggressive development offices which have attracted distribution centers and have started some new poultry processing industries. Among this group, leadership stands out as a factor. The strong performances in LeFlore County, Oklahoma and Henderson County, Tennessee were attributed by state officials to strong local leadership. Lastly, state tax incentives have been successful in bringing jobs to poorer counties, which may explain the low per capita income in many of these high-growth counties.

Quality versus Quantity of Growth

Growth in jobs has not always resulted in economic prosperity as measured by higher per capita income or substantially lower unemployment rates. Referring back to the 38 counties that exhibited the fastest growth, nine still had unemployment rates of 10 percent or higher at the end of 1985. And 12 of the 38 counties had per capita incomes of less than $7,000 in 1984. Nine of the 38 counties are designated as "persistent poverty" counties by USDA. The job growth may be the result of efforts to bring new jobs to those poor counties, but the jobs could also be at low wages that do not significantly raise per capita income.

One characteristic that stands out in particular among counties that gained in manufacturing employment is the nearly uniformly low per capita income (PCI) and high unemployment in counties that had large manufacturing sectors. Of the 49 counties, 29 (59 percent) had a PCI of less than $7,000 in 1985. Per capita income in 41 percent of the manufacturing growth counties declined in actual dollars from 1981 to 1985, and 78 percent declined in constant dollars (purchasing power). Further, despite the job growth, 19 (39 percent) had double digit unemployment rates at the end of 1985 and 74 percent were above eight percent.

The evidence suggests that either (1) jobs frequently are not always bringing sufficiently high wages to raise incomes; or (2) the higher-paying jobs are going to people living outside the county. This finding is not unexpected because low wages remain a primary attraction to businesses that still depend heavily on labor. The more important question is: Will these types of businesses be able to remain competitive in their present locations?

Charting the Future

This study helps chart the course of changes underway through the mid-1980s and, unless circumstances are altered markedly, changes described here are likely to run their course well into the following decade. It does not attempt to make any specific recommendations; suggestions general enough to fit the entire region are difficult to formulate without sounding trite and repeating what by now is obvious. It goes without saying that rural growth is enhanced by strong leadership, an attractive physical environment, good schools and skilled workers, adequate infrastructure, and innovators, and entrepreneurs. The best results are achieved when local communities and individual states assess their own strengths, resources, and opportunities; develop their own goals and plans; and design economic development strategies that fit their own particular situations. And of course, a little bit of luck or serendipity can't hurt either. This report is only a tool for understanding (1) patterns of economic growth in the rural South and (2) what factors are influencing growth in order to identify stimuli for and barriers to jobs and growth.

Patterns of Growth

One of the major findings of the study is that the *growth of jobs in rural areas between 1977 and 1984—a time span that effectively factors out the impact of the national business cycle—improved relative to the period 1977 to 1982, described earlier in* ATF. Even with the revival of employment growth in nonmetro counties, however, the rate of growth of new jobs in metro counties outpaced nonmetro employment growth in all of the SGPB states for the period under consideration. This says as much about the growth and vitality of southern cities as it does about the distress of rural economies, and in comparing the rates of growth of nonmetro counties with metro counties, it is important to note that on average the region's nonmetro employment base did grow. *Moreover, employment growth in the nonmetro South on average improved compared to most other regions.* Nonmetro average annual growth rates (1.93 percent) were nearly twice as high as the national average for that period (1.02 percent). This finding raises some questions about the recent economic projection from the U.S. Bureau of Labor Statistics for 1984 to 2000 that indicates the rural South will have the slowest rate of job growth of any metro or nonmetro region of the country.

While the average may be a sign that rural economic opportunities still exist, the shadows revealed in the earlier study still cover a major segment of the nonmetro South. A large number of nonmetro counties lost net numbers of jobs (almost 20 percent of all nonmetro counties), emphasizing the persistence of the economic decline in some parts of the region.

Second however, the optimism over improved rural job growth must be tempered by the patterns observed in per capita income (PCI) growth and in rates of unemployment. *Overall unemployment and real per capita income among rural residents continues to worsen relative to their metro counterparts.* In more than three fourths of nonmetro counties, the increase in PCI between 1981 and 1985 was less that the rate of inflation (as measured by the rise in the consumer price index). This confirms recent reports from the U.S. Department of Census that rates of poverty are increasing and that real income has not improved through the economy's period of growth. Although unemployment rates have dropped, the difference between metro and nonmetro rates of unemployment in the South have increased. As late as December 1987, nearly one third of all nonmetro counties had double-digit unemployment rates. *The largest issue facing the rural South in the future may not be the number of jobs, but the quality of the jobs.*

A third finding is that the decline of manufacturing employment in the late 1970s was not a temporary short-term pattern, and manufacturing is no longer the major source of new jobs in the rural South. Although some modest post-recession recovery occurred in the manufacturing sector between 1982 and 1984 (when nonmetro counties gained proportionally more manufacturing jobs than metro counties), this resurgence appears to represent modest recovery rather than new growth. During that two-year period, industry in rural counties revived, while in the cities growth slowed. Georgia, Mississippi, North Carolina, and Tennessee experienced particularly high growth in manufacturing during the two post-recessionary years. Based on literature reviewed for this project, foreign investments may be driving the growth. About 70 new Japanese factories started up in the SGPB region between 1980 and 1985, and the number is growing rapidly.

The examination of the manufacturing-intensive counties where employment in manufacturing grew fastest reinforces these findings. Most of these counties fit the traditional mold of textile and apparel employment in small and remote counties with low educational levels, low income, and low costs. Their industrial job growth very likely represented sporadic recovery in one or two plants due to the falling dollar rather than improvements likely to lead to long-term competitiveness. And, in factories that become more automated, even increased competitiveness and higher production is unlikely to result in substantially large increases in employment within the sector. *Growth of employment in the manufacturing sector in both metro and nonmetro counties slacked off to about one half of one percent per year, and actually declined in 45 percent of all nonmetro counties.*

The pattern of growth between 1984 and 1986, examined to provide a more extended view of rural manufacturing growth patterns, presents a sobering view of the industrial development prospects of the rural South. The pattern in the more recent period of 1984 to 1986 reverted back to what it was between 1977 and 1982, reaffirming the structural nature of the changes. Manufacturing growth dropped back almost to its recessionary low.

The patterns of growth do not suggest that manufacturing is no longer important to rural economies, but it does mean that industrial recruitment will not yield the payoffs it has in the past, and that it must be used in moderation as a part of a comprehensive development strategy, not the only or even dominant strategy. The vast majority of new jobs came from service industries, particularly those connected to tourism, and from construction. About 60 percent of the new jobs between 1977 and 1984 were in the service industries and only eight percent from manufacturing. Because cities are better situated for many of the services that depend on population concentration and easy access to transportation, this points to greater long-term growth prospects in urban areas. Technology advances and improved communications networks will provide rural areas with greater opportunity to attract service jobs, but nevertheless many of the high-growth services are more apt to locate in cities and more accessible markets. And, in fact, growth of most service industries slowed in nonmetro counties during the two post-recession years.

The increasing inclination of nonmetro residents to commute to jobs in metro counties rather than move—and for metro employees (and former residents) to choose to live in surrounding, more affordable, nonmetro areas—is another important finding. Metro areas concentrate even more SGPB jobs within their boundaries, while nonmetro areas serve increasingly as outlying labor pools. This may have helped trigger the rebound that occurred in the construction industries. With about half of all nonmetro citizens living in counties adjacent to metro areas, this is a viable alternative to moving. The jobs versus labor pool distinction grows stronger *within* nonmetro areas as well, insofar as manufacturing growth is shown to occur in counties where jobs-to-labor supply ratios have increased. The overall trend, then, is a continued concentration of the region's economy in its most favored counties and a precarious future for the

widely scattered county economics that also lack other highly distinctive qualities. At some point, however, the adjacent nonmetro counties would be reclassified and subsumed by the MSA.

Factors of Growth

While one objective of this analysis was to trace patterns of growth of the region, the other was to find out what factors influenced the patterns within the region. The growth model and other evidence presented here makes clear that the most important growth factors for the average nonmetro county are: *education*, *education* and *education*. The current conventional wisdom about education's beneficial effects on jobs is fully supported: growth and education go hand-in-hand. Counties with higher levels of educational attainment acquired more new jobs and raised per capita income of the population. Throughout the analysis, nonmetro education proved to be highly significant and very nearly the decisive factor in economic growth.

The findings support the growing consensus about the importance of higher skills levels in emerging industries and the rationale for including education in new business climate indicators. Human resources will doubtless remain an important factor in differential growth rates until high average levels of education no longer differ very much between counties in the Southern Growth Policies Board. The universal need for educational improvement is surely responsible for the uniformly high regard with which it has been held by SGPB governors and legislatures during the 1980s. For those who remain unconvinced about the importance of education, this study should remove all lingering doubt.

Related but still distinct are the growth effects which the presence of higher education facilities has on county growth. If measured as the county enrollment levels in colleges or universities, higher education will of course show some correspondence with educational levels of a county's population. The spin-off effects of a well-educated labor supply have already been considered in educational attainment levels. But higher education contributes much more than raw labor skill: its cultural facilities, attractive ambiance, research output and public sense of key personnel and students make tangible contributions to growth potential. And the annual (if not seasonal) stability of economic activity renders many host counties relatively recession-resistant. It is for these reasons that higher education policies which may shift resources from some sites to others provoke such controversy. As noted earlier, college enrollments appear to provide more favorable prospects for nonmetro growth than do universities.

The importance of technical resources to growth—colleges and universities, scientists and technicians, and technical associate degrees—is more vague. Counties in which colleges are located did grow at a greater rate, but still well below the metro growth rate. The number of nonmetro counties with universities was quite small, so that less confidence can be assigned the differences in growth rates.

The concentration of scientists, engineers, and technicians in a county had no immediately evident impact on growth, and was in fact negatively associated with changes in manufacturing employment. The data indicate that the greatest need (and thus employment opportunities) for technically trained workers were in the service industries rather than in manufacturing.

An unexpected finding was that the sum of all scientists, engineers, and technicians had no apparent impact on growth rates and was negatively associated with changes in manufacturing employment growth. There are, however, a number of possible explanations. Scientists and engineers tend to be highly concentrated at or near research centers and large universities, most of which are in metro centers. Metro counties had proportionally twice as many technically trained workers as nonmetro counties. Further, manufacturing in the rural South still employs fewer engineers and technicians on average than in other regions, and traditional branch plants

still dominate the rural South. Their R&D facilities, which employ many of the scientists, engineers, and technicians, are located either outside of the South or in urban areas.

While the size of the technical work force may not influence growth rates, it does influence per capita income, which could indicate that technically trained people were concentrating in nonmetro counties near metro centers where costs were lower and where they can readily commute to jobs.

The analysis offers encouraging support for certain infrastructure policies. County air service and direct access to interstate highways are important contributions to overall growth; however, mere proximity to the interstate system may, in fact, *penalize growth* of such counties whose potential appears to be tapped by their neighbors who do enjoy direct system access. Limited access highways appear to perform precisely as their name suggests. State officials may wish to rethink the overall effects of their total transportation networks and adopt policies that link together modes (air, surface) in ways that induce the spread of growth to each state subregion, even if not to each subregion county.

Several conditions that represent the characteristics of the population and the attractiveness of the location also influence development. For the most part, these conditions, unlike education, human resource development, or infrastructure, are not readily influenced by public policy, but must be taken into account—particularly where they inhibit growth. For example, counties with high concentrations of minority populations experienced very slow growth in jobs and decline in per capita income. For some time now, there has been an unwritten rule of thumb that businesses were difficult to attract to counties where more than one-third of the population is black. It appears from the data that one-third may be too low a threshold; the counties that were left farthest behind in the acquisition of new jobs and income were those that are more than half black. Average per capita income of counties that are half black actually was lower in current dollars in 1985 than in 1981. Most distressing was the fact that even high levels of educational attainment failed to result in high growth in predominantly minority counties.

The physical attractiveness of counties was perhaps the strongest predictor of growth. It provides opportunities for development in tourism industries and it attracts retirees. As the population ages, and as recreation and quality of life become more important to people, counties that have particularly desirable physical attributes also have special opportunities for development. Jobs in the service industries that were associated with tourism were associated with high overall employment growth—either because they stimulated growth or reflected growing prosperity. Recreational opportunities and in-migration of retirees are the most readily identifiable factors among the group of counties that grew the fastest in the rural South. For the most part, the location of these counties are likely to attract tourists or retirees—along the coast, in the mountains, or very near other recreational areas. Further, even though tourism-related industries often pay low wages, the per capita income in those counties with large tourism industries or high growth of those industries increased the most.

The strong influence of environmental conditions on growth in the light of the degradation of Atlantic beaches caused by pollution and the deforestation in the mountains poses a challenge to policymakers. North Carolina, for example, is considering limits to growth along its coast in order to preserve the conditions that brought the growth in the first place. Environmental planning ought to be an integral part of economic development everywhere, but particularly in counties whose economies depend on tourism and recreation.

Finally, a closer look at the outlier nonmetro counties—those that have outperformed the region's rural economy, those that have fallen much farther behind, and those that have beaten the odds and done better than expected based on the relationships unraveled in the study—reveals a host of unique or unusual circumstances responsible for above average growth (or decline). They include attracting spillover economic benefits from burgeoning metro centers

with lower costs and less congestion, aggressive leadership, and special employers such as a military base or state conference center.

What Next?

Ranging from singular leadership of key local officials down through a variety of unique locations (e.g. near military bases, nuclear plants, national forests, attractive coastlines or universities), one gains a healthy appreciation for the variety of factors that remain beyond the grasp of active state policymaking. Governors and legislators have few tools that effectively energize these local factors from afar.

In the end, the best one can hope for is a sound mix of "enabling" state policies that leave open to local officials and citizens the fullest opportunity to improve their economic and social conditions. If the Southern Growth Policies Board region is "halfway home," it is clearer now in what direction the next steps must lead. If pressed to name policies that could "enable" and revitalize rural growth, however, *intelligence, participation, and connections* would be at the top of the list.

Intelligence includes the widespread knowledge and skills that result from better educational and from cultural, and social experiences—already the highest priority in southern states. Rural communities also need access to timely information and help in organizing and using the information for planning. Few small communities and few small businesses have the capability, resources, or capacity to do strategic planning, which ought to be basic to the development process. Intelligence must not only be collected but put forth in such a way and with enough technical assistance so that rural people can acquire, organize, interpret, use, and maintain it. Department of Commerce documents tend to be organized as inventories to help industries select sites, not as analyses to help communities plan their futures and make wiser investment decisions.

Successful rural development is often the result of total community efforts, with broad-based participation. The winning proposal that Jackson County, Kentucky prepared for Mid-South Electric Company last year brought an entire community together, from the mayor and town librarian to the elementary school children who colored the maps for the final version. Participation and consensus are important elements of rural development.

And, achieving the economies of scale needed to participate and compete in a global economy requires network-building and collaboration. Small and medium-sized enterprises working independently often lack the resources to respond to new market opportunities or to modernize. By forming networks and cooperative arrangements, they can retain the flexibility and innovativeness of smaller scale and still have some of the advantages of larger size. Few programs actively encourage the kind of collaborative efforts that have catalyzed the growth of small and medium-sized manufacturing in many parts of western Europe. State programs could do much more to remove barriers to cooperation and actively encourage and facilitate cooperation between public and private enterprises and among private enterprises. Among the first might be assuring small firms that cooperation is not in violation of anti-trust statutes. Networks may, in the long run, be the most important ingredient of rural industrial revitalization.

Appendix A

Industry Classifications

Sector	*Industry Components*
1	Agriculture and Resources
	Agricultural Services
	Forestry
2	Mining
	Metal Mining
	Anthracite Mining
	Bituminous Coal and Lignite Mining
	Oil and Gas Extraction
	Nonmetallic Minerals, Except Fuels
3	Construction
	General Building Contractors
	Heavy Construction Contractors
	Special Trade Contractors
4	Traditional Durables
	Furniture and Fixtures
	Stone, Clay, and Glass Products
	Primary Metal Industries
5	Traditional Nondurables
	Food and Kindred Products
	Tobacco Manufacturers
	Textile Mill Products
	Apparel and Other Textile Products
	Lumber and Wood Products
	Paper and Allied Products
	Leather and Leather Products
6	Emerging Durables
	Fabricated Metal Products
	Machinery, Except Electrical
	Electric and Electronic Equipment
	Transportation Equipment
	Instruments and Related Products
	Miscellaneous Manufacturing Industries
7	Emerging Nondurables
	Printing and Publishing
	Chemicals and Allied Products
	Petroleum and Coal Products
	Rubber and Miscellaneous Plastics Products

8	Urban Services	
		Local and Interurban Passenger Transit
		U.S. Postal Service
		Transportation by Air
		Communications
		Electric, Gas, and Sanitary Services
		Building Materials and Garden Supplies
		Credit Agencies Other than Banks
		Security, Commodity Brokers, and Services
		Real Estate
		Combined Real Estate, Insurance, Etc.
		Hotels and Other Lodging Places
		Miscellaneous Repair Services
		Legal Services
		Membership Organizations
9	Producer Services	
		Railroad Transportation
		Trucking and Warehousing
		Water Transportation
		Pipe Lines, Except Natural Gas
		Transportation Services
		Wholesale Trade - Durable Goods
		Wholesale Trade - Nondurable Goods
		Holding and Other Investment Offices
		Business Services
		Miscellaneous Services
10	Consumer Services	
		Banking
		General Merchandise Stores
		Food Stores
		Auto Dealers and Service Stations
		Apparel and Accessory Stores
		Furniture and Home Furnishing Stores
		Eating and Drinking Places
		Miscellaneous Retail
		Personal Services
		Auto Repair, Services, and Garages
		Motion Pictures
		Amusement and Recreation Services
		Health Services
		Educational Services
		Social Services
		Museums, Botanical, Zoological Gardens
11	New Technology	
		Machinery, Except Electrical
		Electric and Electronic Equipment
		Instruments and Related Products

Appendix B

State Profiles

Alabama

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults, 1980	20.55	31.81
Four years of High School, % of Adults, 1980	61.32	48.10
Four years of College, % of Adults, 1980	14.19	8.70
Technical Work Force, % of Total Labor Force, 1980	4.31	1.61
Population and Income		
Percent of State Population, 1985	63.6	36.4
Population Annual Growth Rate, 1980-1985	0.77	0.42
Blacks, % of Total Population	25.70	25.38
Per Capita Income, 1985	$9330	$7491
PCI Annual Growth Rate, 1981-85	1.93	2.41
Economy		
Percent of Total Employment, 1984	69.70	30.30
Manufacturing, % of Total Employment, 1984	17.81	39.55
High-Tech Manufacturing, % of Manufacturing, 1982	27.44	9.61
Tourism, % of Total Employment, 1984	9.35	5.59
Unemployment Rate, 1985	7.97	10.54

Arkansas

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults, 1980	19.38	30.99
Four years of High School, % of Adults, 1980	63.83	50.44
Four years of College, % of Adults, 1980	14.33	8.72
Technical Work Force, % of Total Labor Force, 1980	2.16	1.20
Population and Income		
Percent of State Population, 1985	39.1	60.9
Population Annual Growth Rate, 1980-1985	0.83	0.49
Blacks, % of Total Population	18.53	14.92
Per Capita Income, 1985	$9497	$7664
PCI Annual Growth Rate, 1981-85	2.76	1.13
Economy		
Percent of Total Employment, 1984	48.60	51.40
Manufacturing, % of Total Employment, 1984	19.83	32.29
High-Tech Manufacturing, % of Manufacturing, 1982	24.12	20.13
Tourism, % of Total Employment, 1984	10.09	7.14
Unemployment Rate, 1985	6.76	10.21

Florida

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	15.67	23.37
Four years of High School, % of Adults	67.52	57.90
Four years of College, % of Adults	15.34	10.11
Technical Work Force, % of Total Labor Force	2.59	1.46
Population and Income		
Percent of State Population, 1985	91.00	9.00
Population Annual Growth Rate, 1980-1985	3.19	3.61
Blacks, % of Total Population	13.74	14.16
Per Capita Income, 1985	$11469	$9196
PCI Annual Growth Rate, 1981-85	6.54	9.20
Economy		
Percent of Total Employment, 1984	94.10	5.90
Manufacturing, % of Total Employment, 1984	11.29	12.92
High-Tech Manufacturing, % of Manufacturing, 1982	38.46	40.01
Tourism, % of Total Employment, 1984	14.46	10.38
Unemployment Rate, 1985	5.87	7.71

Georgia

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	16.19	32.25
Four years of High School, % of Adults	66.42	44.10
Four years of College, % of Adults	15.89	9.07
Technical Work Force, % of Total Labor Force	2.66	1.43
Population and Income		
Percent of State Population, 1985	63.8	36.2
Population Annual Growth Rate, 1980-1985	2.81	1.02
Blacks, % of Total Population	17.44	26.79
Per Capita Income, 1985	$11316	$8015
PCI Annual Growth Rate, 1981-85	6.28	3.62
Economy		
Percent of Total Employment, 1984	70.00	30.00
Manufacturing, % of Total Employment, 1984	13.00	36.78
High-Tech Manufacturing, % of Manufacturing, 1982	31.36	9.13
Tourism, % of Total Employment, 1984	13.63	7.11
Unemployment Rate, 1985	5.89	8.38

Kentucky

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	21.52	39.77
Four years of High School, % of Adults	62.06	45.44
Four years of College, % of Adults	14.43	8.20
Technical Work Force, % of Total Labor Force	2.58	1.22
Population and Income		
Percent of State Population, 1985	45.5	54.5
Population Annual Growth Rate, 1980-1985	0.20	0.48
Blacks, % of Total Population	10.62	4.09
Per Capita Income, 1985	$10200	$7288
PCI Annual Growth Rate, 1981-85	0.99	0.96
Economy		
Percent of Total Employment, 1984	56.50	43.50
Manufacturing, % of Total Employment, 1984	19.38	22.28
High-Tech Manufacturing, % of Manufacturing, 1982	19.95	22.27
Tourism, % of Total Employment, 1984	11.05	6.25
Unemployment Rate, 1985	7.58	11.59

Louisiana

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	17.12	32.76
Four years of High School, % of Adults	62.30	47.35
Four years of College, % of Adults	16.06	9.09
Technical Work Force, % of Total Labor Force	3.38	1.45
Population and Income		
Percent of State Population, 1985	69.1	30.9
Population Annual Growth Rate, 1980-1985	1.37	1.07
Blacks, % of Total Population	28.97	30.50
Per Capita Income, 1985	$9638	$7037
PCI Annual Growth Rate, 1981-85	-0.28	-0.28
Economy		
Percent of Total Employment, 1984	77.90	22.10
Manufacturing, % of Total Employment, 1984	10.00	15.92
High-Tech Manufacturing, % of Manufacturing, 1982	40.26	18.76
Tourism, % of Total Employment, 1984	n/a	n/a
Unemployment Rate, 1985	10.69	13.89

Mississippi

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	16.29	30.50
Four years of High School, % of Adults	66.40	50.21
Four years of College, % of Adults	16.43	10.66
Technical Work Force, % of Total Labor Force	2.94	1.71
Population and Income		
Percent of State Population, 1985	29.4	70.6
Population Annual Growth Rate, 1980-1985	1.44	0.43
Blacks, % of Total Population	29.85	37.31
Per Capita Income, 1985	$9053	$6800
PCI Annual Growth Rate, 1981-85	2.76	0.21
Economy		
Percent of Total Employment, 1984	34.70	65.30
Manufacturing, % of Total Employment, 1984	16.52	31.01
High-Tech Manufacturing, % of Manufacturing, 1982	16.98	13.67
Tourism, % of Total Employment, 1984	10.81	6.74
Unemployment Rate, 1985	7.72	11.62

North Carolina

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	19.68	29.69
Four years of High School, % of Adults	60.26	48.43
Four years of College, % of Adults	16.41	9.48
Technical Work Force, % of Total Labor Force	2.85	1.55
Population and Income		
Percent of State Population, 1985	56.9	43.1
Population Annual Growth Rate, 1980-1985	3.10	1.05
Blacks, % of Total Population	20.29	24.98
Per Capita Income, 1985	$10556	$8169
PCI Annual Growth Rate, 1981-85	6.65	3.00
Economy		
Percent of Total Employment, 1984	63.20	36.80
Manufacturing, % of Total Employment, 1984	27.78	38.28
High-Tech Manufacturing, % of Manufacturing, 1982	18.44	13.06
Tourism, % of Total Employment, 1984	10.13	7.39
Unemployment Rate, 1985	4.33	6.95

Oklahoma

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	13.40	24.68
Four years of High School, % of Adults	72.10	58.16
Four years of College, % of Adults	17.62	11.83
Technical Work Force, % of Total Labor Force	3.23	2.10
Population and Income		
Percent of State Population, 1985	58.0	42.0
Population Annual Growth Rate, 1980-1985	2.12	1.25
Blacks, % of Total Population	8.73	4.17
Per Capita Income, 1985	$10859	$8225
PCI Annual Growth Rate, 1981-85	1.24	0.49
Economy		
Percent of Total Employment, 1984	68.80	31.20
Manufacturing, % of Total Employment, 1984	13.11	14.99
High-Tech Manufacturing, % of Manufacturing, 1982	40.11	29.52
Tourism, % of Total Employment, 1984	10.90	7.10
Unemployment Rate, 1985	6.46	8.20

South Carolina

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	22.40	30.62
Four years of High School, % of Adults	57.66	47.78
Four years of College, % of Adults	15.29	10.62
Technical Work Force, % of Total Labor Force	3.27	1.64
Population and Income		
Percent of State Population, 1985	40.2	39.8
Population Annual Growth Rate, 1980-1985	1.50	1.09
Blacks, % of Total Population	24.79	38.65
Per Capita Income, 1985	$9637	$7767
PCI Annual Growth Rate, 1981-85	4.69	3.45
Economy		
Percent of Total Employment, 1984	66.70	33.30
Manufacturing, % of Total Employment, 1984	24.91	38.38
High-Tech Manufacturing, % of Manufacturing, 1982	25.96	16.23
Tourism, % of Total Employment, 1984	10.29	8.25
Unemployment Rate, 1985	5.54	9.06

Tennessee

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	22.37	37.25
Four years of High School, % of Adults	61.85	45.88
Four years of College, % of Adults	15.30	7.72
Technical Work Force, % of Total Labor Force	3.11	1.98
Population and Income		
Percent of State Population, 1985	65.0	35.0
Population Annual Growth Rate, 1980-1985	0.81	0.59
Blacks, % of Total Population	19.60	8.78
Per Capita Income, 1985	$10096	$7781
PCI Annual Growth Rate, 1981-85	3.04	4.00
Economy		
Percent of Total Employment, 1984	71.90	28.10
Manufacturing, % of Total Employment, 1984	20.03	41.83
High-Tech Manufacturing, % of Manufacturing, 1982	25.33	15.55
Tourism, % of Total Employment, 1984	11.16	6.02
Unemployment Rate, 1985	6.37	11.40

Virginia

	Metro	Nonmetro
Human Resources		
Eight years of education or less, % of Adults	14.24	34.54
Four years of High School, % of Adults	69.29	46.54
Four years of College, % of Adults	22.99	10.05
Technical Work Force, % of Total Labor Force	4.89	2.06
Population and Income		
Percent of State Population, 1985	70.8	29.2
Population Annual Growth Rate, 1980-1985	1.53	0.84
Blacks, % of Total Population	20.00	16.20
Per Capita Income, 1985	$13054	$8863
PCI Annual Growth Rate, 1981-85	5.34	4.19
Economy		
Percent of Total Employment, 1984	77.60	22.40
Manufacturing, % of Total Employment, 1984	12.54	27.81
High-Tech Manufacturing, % of Manufacturing, 1982	25.92	18.36
Tourism, % of Total Employment, 1984	11.21	6.97
Unemployment Rate, 1985	4.58	8.87

Appendix C

Distribution of Employment, Population, and Labor Force by County Location 1977, 1984

State of Alabama

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	12	5.76	5.66	6.60	6.33
Tier	1	1.16	0.97	1.01	0.92
Corridor	3	1.07	1.07	1.37	1.35
Adjacent	17	9.19	8.55	10.92	11.08
Adj/Cor	15	13.26	14.05	16.64	16.69
Nonmetro	48	30.45	30.30	36.54	36.37
Metro	19	69.55	69.70	63.46	63.63

State of Arkansas

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	35	26.23	26.34	30.08	29.60
Tier	2	0.75	0.53	0.92	0.83
Corridor	6	6.98	6.76	7.65	7.70
Adjacent	13	9.04	9.29	12.61	11.81
Adj/Cor	9	8.74	8.50	9.84	9.12
Nonmetro	65	51.76	51.41	61.10	59.05
Metro	10	48.24	48.59	38.90	40.95

State of Florida

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	4	0.79	0.67	0.83	0.64
Tier	2	0.24	0.20	0.31	0.34
Corridor	3	0.35	0.31	0.45	0.44
Adjacent	12	1.63	1.55	2.89	2.49
Adj/Cor	14	3.24	3.16	4.64	3.79
Nonmetro	35	6.25	5.89	9.12	7.70
Metro	32	93.75	94.11	90.88	92.30

State of Georgia

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	46	9.84	8.94	11.48	10.97
Tier	12	2.38	2.20	3.27	2.96
Corridor	13	6.02	5.67	6.07	5.82
Adjacent	24	3.91	3.66	5.14	5.04
Adj/Cor	26	9.86	9.48	10.67	11.09
Nonmetro	121	32.02	29.96	36.63	35.88
Metro	38	67.98	70.04	63.37	64.12

State of Kentucky

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	42	18.11	17.83	23.67	20.91
Tier	13	3.15	2.92	5.13	4.87
Corridor	12	9.85	10.25	9.69	10.04
Adjacent	17	3.95	3.63	5.82	5.68
Adj/Cor	17	8.53	8.91	10.26	9.63
Nonmetro	101	43.59	43.53	54.57	51.13
Metro	19	56.41	56.47	45.43	48.87

State of Louisiana

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	9	4.83	4.69	6.11	5.28
Tier	5	1.29	1.21	2.29	2.04
Corridor	1	0.20	0.17	0.35	0.28
Adjacent	10	2.62	2.67	4.81	4.13
Adj/Cor	20	13.78	13.36	17.41	16.87
Nonmetro	45	22.72	22.10	30.97	28.54
Metro	19	77.28	77.90	69.03	71.46

State of Mississippi

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	36	33.39	33.81	33.87	34.69
Tier	11	4.88	4.52	6.78	6.24
Corridor	13	18.97	18.45	18.02	17.60
Adjacent	7	3.52	3.55	5.09	5.12
Adj/Cor	8	4.94	4.95	7.01	6.75
Nonmetro	75	65.69	65.28	70.78	70.39
Metro	7	34.31	34.72	29.22	29.61

State of North Carolina

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	34	12.14	12.00	14.51	13.58
Tier	7	4.63	4.31	5.50	5.26
Corridor	4	2.62	2.53	2.81	2.78
Adjacent	18	6.52	6.41	9.54	8.71
Adj/Cor	12	11.99	11.50	12.94	12.32
Nonmetro	75	37.90	36.76	45.30	42.66
Metro	25	62.10	63.24	54.70	57.34

State of Oklahoma

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	21	6.70	5.99	9.09	8.03
Tier	3	0.47	0.56	1.24	1.15
Corridor	10	6.89	6.79	8.02	7.72
Adjacent	14	7.46	6.93	10.20	9.55
Adj/Cor	15	11.56	10.93	13.66	12.72
Nonmetro	63	33.09	31.20	42.21	39.16
Metro	14	66.91	68.80	57.79	60.84

State of South Carolina

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	7	8.19	8.99	9.17	10.19
Tier	3	2.78	3.01	3.93	3.51
Corridor	2	0.49	0.46	1.00	0.92
Adjacent	5	3.38	2.75	3.94	3.78
Adj/Cor	17	19.02	18.05	22.05	21.48
Nonmetro	36	66.13	33.27	40.08	39.89
Metro	12	33.87	66.73	59.92	60.11

State of Tennessee

Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	15	3.61	3.52	4.90	4.59
Tier	14	5.67	4.78	6.72	6.27
Corridor	10	7.79	7.87	8.12	8.41
Adjacent	10	1.91	1.75	2.85	2.52
Adj/Cor	20	10.89	10.20	12.49	11.29
Nonmetro	69	29.87	28.13	35.08	33.08
Metro	26	70.13	71.87	64.92	66.92

State of Virginia

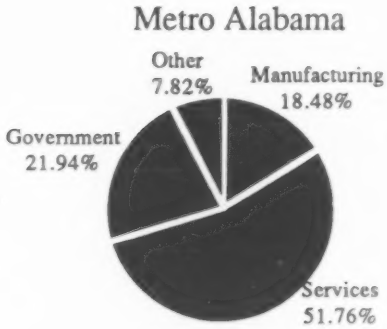
Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	19	4.35	3.65	5.85	5.13
Tier	1	0.28	0.25	0.32	0.28
Corridor	15	6.24	5.41	6.15	6.27
Adjacent	24	6.28	5.18	7.43	7.09
Adj/Cor	26	8.56	7.86	9.55	8.84
Nonmetro	85	25.71	22.35	29.30	27.61
Metro	51	74.29	77.65	70.70	72.39

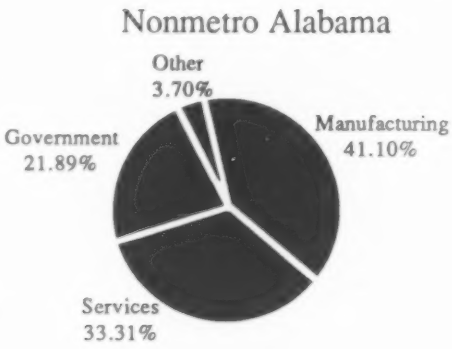
Southern Growth Policies Board Region

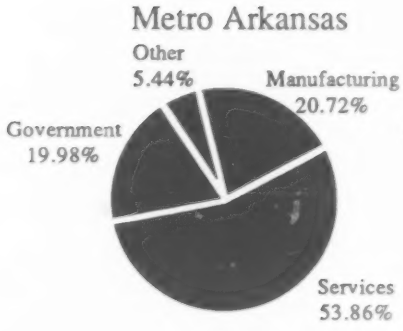
Location	Number of Counties	% of Total Employment 1977	% of Total Employment 1984	% of Population 1984	% of Total Labor Force 1984
Remote	280	8.62	8.04	10.21	9.51
Tier	74	2.21	1.95	2.81	2.60
Corridor	92	4.57	4.22	4.70	4.66
Adjacent	171	4.52	4.14	6.17	5.82
Adj/Cor	199	9.81	9.30	11.35	10.73
Nonmetro	816	29.73	27.66	35.24	33.33
Metro	272	70.27	72.34	64.76	66.67

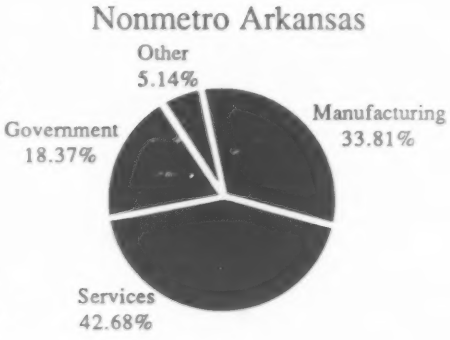
Appendix D

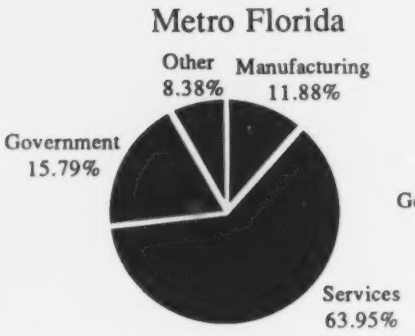
Distribution of Employment by State, Metro and Nonmetro, 1984

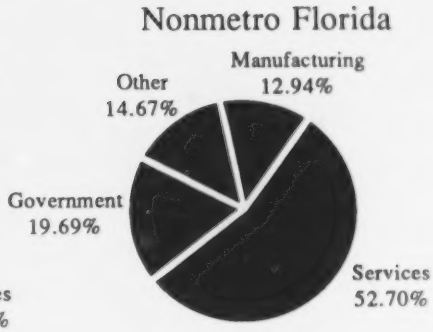


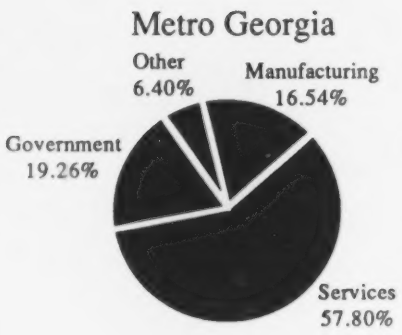


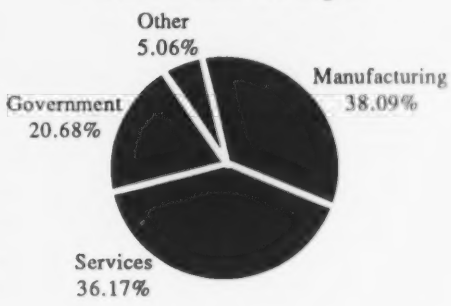


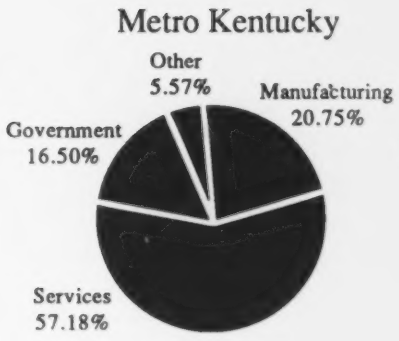


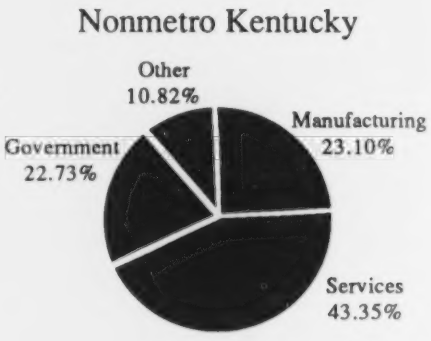

Metro Florida
Other
8.38%
Manufacturing
11.88%
Government
15.79%
Services
63.95%

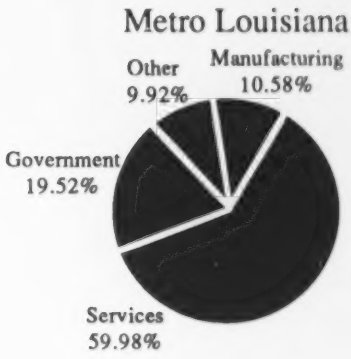

Nonmetro Florida
Manufacturing
12.94%
Other
14.67%
Government
19.69%
Services
52.70%

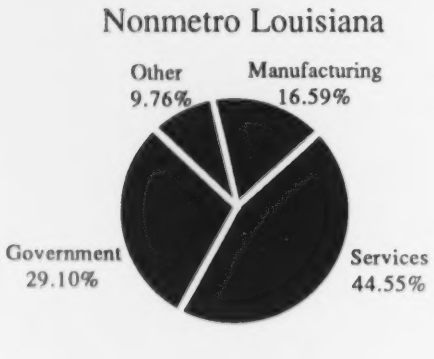

Metro Georgia
Other
6.40%
Manufacturing
16.54%
Government
19.26%
Services
57.80%


Nonmetro Georgia
Other
5.06%
Manufacturing
38.09%
Government
20.68%
Services
36.17%

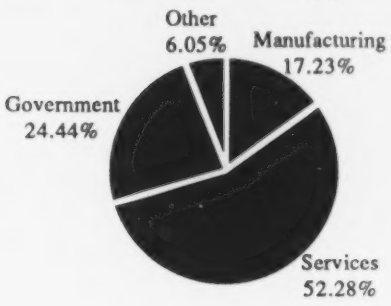

Metro Kentucky
Other
5.57%
Manufacturing
20.75%
Government
16.50%
Services
57.18%


Nonmetro Kentucky
Other
10.82%
Manufacturing
23.10%
Government
22.73%
Services
43.35%

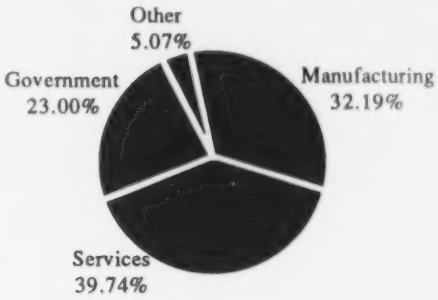

Metro Louisiana
Other
9.92%
Manufacturing
10.58%
Government
19.52%
Services
59.98%


Nonmetro Louisiana
Other
9.76%
Manufacturing
16.59%
Government
29.10%
Services
44.55%

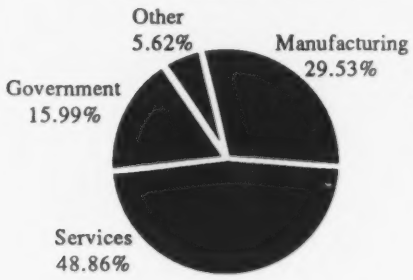
Metro Mississippi



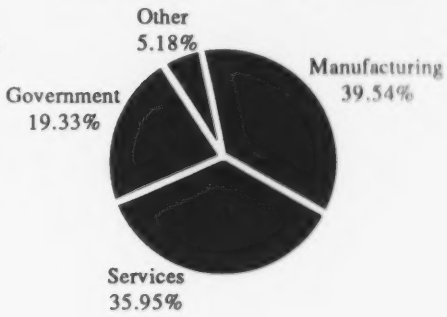
Nonmetro Mississippi

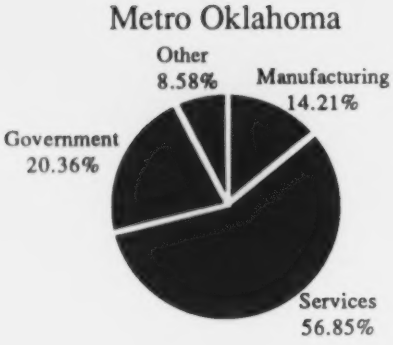


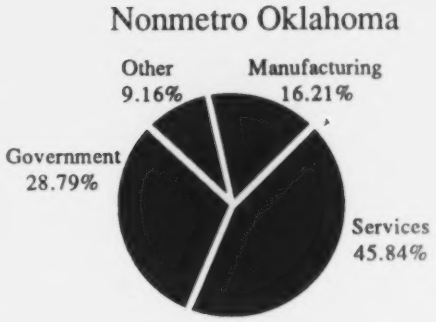
Metro North Carolina

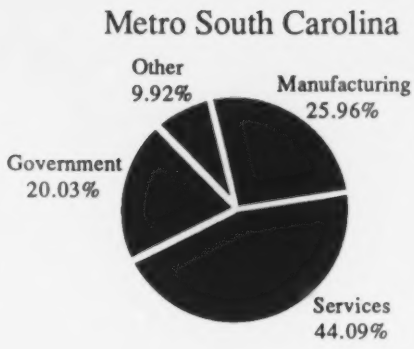


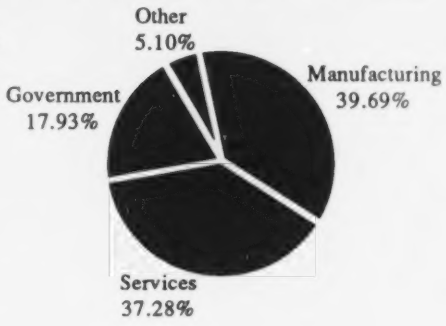
Nonmetro North Carolina

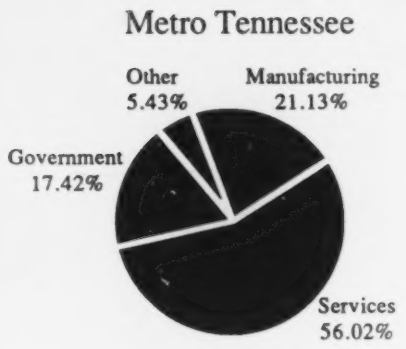


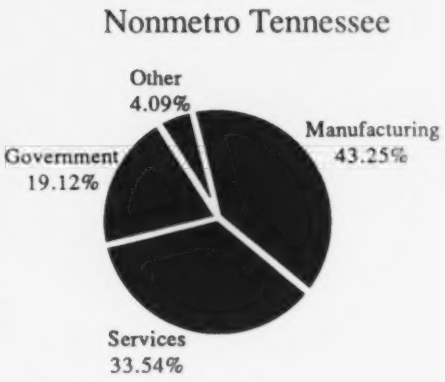

Metro Oklahoma
Other
8.58%
Manufacturing
14.21%
Government
20.36%
Services
56.85%

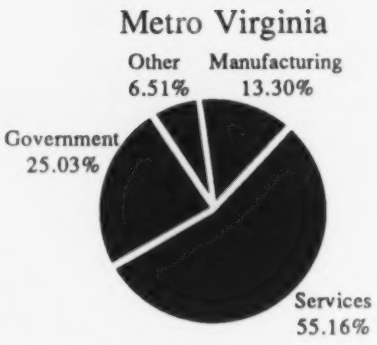

Nonmetro Oklahoma
Other
9.16%
Manufacturing
16.21%
Government
28.79%
Services
45.84%

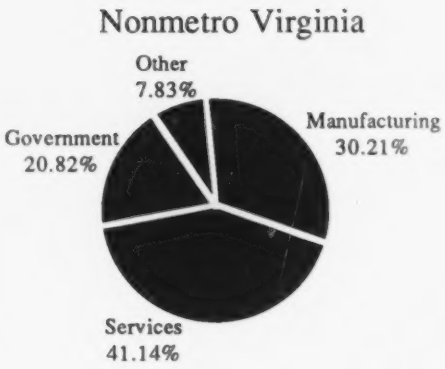

Metro South Carolina
Other
9.92%
Manufacturing
25.96%
Government
20.03%
Services
44.09%

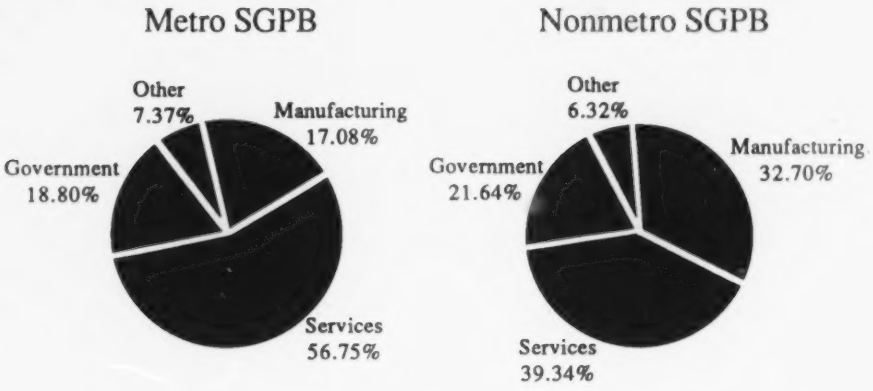

Nonmetro South Carolina
Other
5.10%
Manufacturing
39.69%
Government
17.93%
Services
37.28%


Metro Tennessee
Other
5.43%
Manufacturing
21.13%
Government
17.42%
Services
56.02%


Nonmetro Tennessee
Other
4.09%
Manufacturing
43.25%
Government
19.12%
Services
33.54%

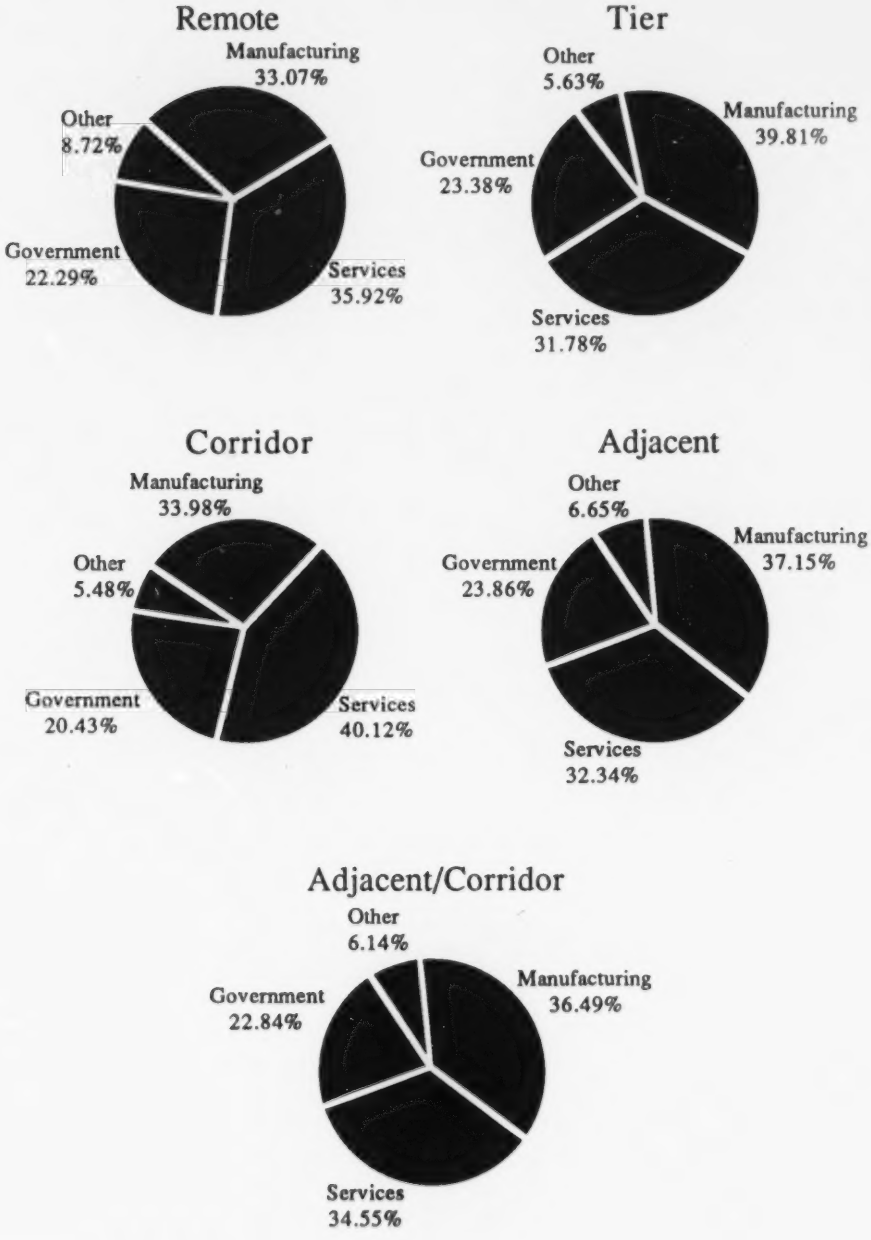

Metro Virginia
Other
6.51%
Manufacturing
13.30%
Government
25.03%
Services
55.16%


Nonmetro Virginia
Other
7.83%
Manufacturing
30.21%
Government
20.82%
Services
41.14%


Metro SGPB
Other
7.37%
Manufacturing
17.08%
Government
18.80%
Services
56.75%
Nonmetro SGPB
Other
6.32%
Manufacturing
32.70%
Government
21.64%
Services
39.34%

Appendix E

Distribution of Nonmetro Employment by Location, 1984



Appendix F

Occupational Classifications Included in "Technical"

Engineers

Aerospace engineers
Metallurgical and materials engineers
Mining engineers
Petroleum engineers
Chemical engineers
Nuclear engineers
Civil engineers
Agricultural engineers
Electrical and electronic engineers
Industrial engineers
Mechanical engineers
Marine and naval architects
Engineers, N.E.C.

Mathematical and Computer Scientists

Computer systems analysts and scientists
Operations and systems research and analysts
Actuaries
Statisticians
Mathematical scientists

Natural Scientists

Physicists and astronomers
Chemists, except biochemists
Atmospheric and space scientists
Geologists and geodesists
Physical scientists
Agriculture and food scientists
Biological and life scientists
Forestry and conservation scientists

Engineering and Related Technologists and Technicians

Electrical and electronic technicians
Industrial engineering technicians
Mechanical engineering technicians
Engineering technicians, N.E.C.

Science Technicians

Biological technicians
Chemical technicians
Science technicians

Technicians Except Health, Engineering, and Science

Air traffic controllers
Broadcast equipment operators
Computer programmers
Tool programmers, numerical control
Technicians, N.E.C.

Appendix G

Top 100 High Tech Industries

SIC	Industry Name
2812	Alkalies & chlorine
2813	Industrial gases
2816	Inorganic pigments
2819	Industrial inorganic chemicals
2821	Plastic materials, synthetic resins
2822	Synthetic rubber
2823	Cellulosic man-made fibers
2824	Synthetic organic fibers, except cellulose
2831	Biological products
2833	Medical, chemical, botanical products
2834	Pharmaceutical preparations
2841	Soap, other detergents
2842	Special cleaning, polishing preparations
2843	Surface active finishing agents
2844	Perfumes, cosmetics, toilet preparations
2851	Paints, varnishes, lacquers, enamels
2861	Gum, wood chemicals
2865	Cyclic crudes, intermediates, dyes
2869	Industrial organic chemicals, NEC
2873	Nitrogenous fertilizers
2874	Phosphatic fertilizers
2875	Fertilizers, mixing only
2879	Pesticides, agricultural chemicals, NEC
2891	Adhesives, sealants
2892	Explosives
2893	Printing ink
2895	Carbon black
2899	Chemicals, chemical preparations, NEC
2911	Petroleum refining
3031	Reclaimed rubber
3511	Steam, gas, hydraulic turbines
3519	Internal combustion engines, NEC
3531	Construction machine equipment
3532	Mining machinery equipment
3533	Oilfield machinery equipment

3534	Elevators, moving stairways
3535	Conveyors, conveying equipment
3536	Hoists, industrial cranes, monorail systems
3537	Industrial trucks, tractors, trailers, stackers
3541	Machine tools, metal cutting types
3542	Machine tools, metal forming types
3544	Specialty dies, die sets, jigs fixtures, industry molds
3545	Machine tool accessories, measuring devices
3546	Power driven hand tools
3547	Rolling mill machinery equipment
3549	Metalworking machinery, NEC
3561	Pumps, pumping equipment
3562	Ball, roller bearings
3563	Air, gas compressors
3564	Blowers, exhaust, ventilation fans
3565	Industrial patterns
3566	Speed changers, industrial high drives, gears
3567	Industrial process furnaces, ovens
3568	Mechanical power transmission equipment, NEC
3569	General industrial machinery equipment, NEC
3573	Electronic computing equipment
3574	Calculating accounting machines, except electrical computer equipment
3576	Scales, balances, except laboratory
3579	Office machinery, NEC
3612	Power, distribution special transformers
3613	Switch gear, switchboard apparatus
3621	Motors, generators
3622	Industrial controls
3623	Welding apparatus, electric
3624	Carbon, graphite products
3629	Electrical industrial apparatus, NEC
3651	Radio, TV receiving sets, except communication types
3652	Phono records, pre-recorded magnetic tape
3661	Telephone, telegraph apparatus
3662	Radio, TV transmitting, signal, detection equipment
3671	Cathode ray tubes, NEC
3674	Semiconductors, related devices
3675	Electronic capacitors
3676	Resistors for electronic applications
3677	Resistors, electric apparatus
3678	Connectors, electronic applications
3679	Electronic components, NEC

3721	Aircraft
3724	Aircraft engines, parts
3728	Aircraft parts, auxiliary equipment, NEC
3743	Railroad equipment

Appendix H

A Short Description of the Creation of National Planning Data Corporation's Enhanced County Business Patterns (ECBP) File Using the "Iterative Proportional Fitting" (IPF) Technique

The following is some information pertaining to NPDC's "Enhanced" County Business Patterns (ECBP), as opposed to the regular County Business Patterns (CBP) file from the Census Bureau.

1. The ECBP is a file created by NPDC through additional processing of the CBP that involves estimating the missing data. A brief description of the estimating technique we employed, which incorporates the "Iterative Proportional Fitting" method, is provided in this information sheet.

NPDC has converted the current year of the CBP to the ECBP as well as selected prior years. At no time during the conversion process did NPDC have access to any special Census Bureau data files other than the publicly available County Business Patterns data.

2. The regular CBP never suppresses the count of total establishments or the count of establishments by employment size range. What is frequently suppressed (65% at the county level) are counts of total number of employees (for the week including March 12) and first quarter and annual payroll figures.

In the case of suppressed employee data, the Census Bureau provides a suppression flag consisting of an "alpha" code indicating the range in which the total employee number is supposed to fit:

A:	0-19	E:	250-499	H:	2500-4999	K:	25,000-49,999
B:	20-99	F:	500-999	I:	5000-9999	L:	50,000-99,999
C:	100-249	G:	1000-2499	J:	10000-24999	M:	100,000 or more

Thus a user of the Census Bureau CBP could guess a number of employees for a particular SIC in a particular geography based on this flag.

Employees and payroll are always suppressed together, so the suppression flag for payroll will be the same as for employees.

3. NPDC created the ECBP file so that a database would be available in which the employee suppression flags have been replaced by estimated counts. These estimates are within the range specified by the suppression flag and have been adjusted (up or down) so that any "filled in" numbers are internally consistent with other unsuppressed subtotals and totals in the CBP file. We sometimes use the term "additive" when we refer to this internal consistency.

The additivity concepts we are referring to are the following:

A. For a given geography (county or state) the number of employees for each set of 4-digit SICs would sum to the corresponding 3-digit SIC for that geography. Each set of 3-digit SICs would add to the 2-digit for the particular geography.

B. For a particular SIC code (2-, 3-, or 4-digit) the number of employees in each county of the state should sum to the state total for that SIC, and the number of employees for that SIC code.

C. Any replacement of a suppression flag with an estimated count is done so as to meet both conditions A and B simultaneously.

4. The mathematical technique we have used to come up with a consistent set of numbers is known as the "Iterative Proportional Fitting" (IPF) method. It is an accepted and proven technique for this type of application. It is also a "computer (CPU) intensive" process involving a complex set of "checking" algorithms. In our use of the IPF methodology we adhere to the following guidelines:

A. We never change "real" (unsuppressed) data that appears on the original Census Bureau reels.

B. Likewise, when we first use a "real" number to replace an employee suppression indicator, this "real" number is never allowed to be greater than the upper limit or less than the lower limit indicated by the code.

C Although the number of establishments is never suppressed by the Census Bureau, there are instances where the number of establishments do not add properly across geography or SIC codes. (For example, the number of establishments for all of a series of 4-digit SICs may not add to the total for the appropriate 2-digit number.) In such instances it is necessary to "correct for the noise" in the Census Bureau file by creating "remainder" SIC codes containing counts that force the number of establishments to add.

D. When the difference between a published U.S. 4-digit SIC employee total and NPDC's number (summed from county to state to U.S.) is less than 20 employees and 1% of the total, then "additivity" is satisfied. In those cases where adhering to rules A and B prohibits NPDC's total from agreeing closely enough with the published U.S. total, then a separate list of these differences is maintained.

5. The accompanying table provides an illustration of the complexity of the additivity checking procedures that are employed by NPDC.

PLEASE NOTE: NPDC has not employed the detailed IPF checks on the "filled in" payroll numbers. A payroll number for a particular SIC and geography is determined using the corresponding employee number that is first estimated at the beginning of the IPF procedures. This employee number is multiplied by an average payroll figure for the SIC at the state or U.S. level (whichever is unsuppressed) to come up with an (aggregate) payroll figure.

Table Showing Additivity Cross-Checks Carried Out on Employee Numbers and Approximate Number of Data Cells for Each SIC/Geography Level

The numbers in the boxes are the approximate number of data cells for each geography/SIC level. Also note that the data that are represented by the top edge (US total, state total, and county total: independent of SIC) and the left edge (2-, 3-, and 4-digit SIC totals for the U.S.) of the drawing are, for all practical purposes, never suppressed.

Each arrow on the chart indicates that the level below or the level to the right should sum to the level to which the arrow is pointing.

	U.S.	State	County
1-digit (total)	1	≤ 51	≤ 3137
2-digit SICs	Approx. 50	≤ Approx. 1500	≤ Approx. 37,000
3-digit SICs	Approx. 300	≤ Approx. 15,000	≤ Approx. 350,000
4-digit SICs	Approx. 700	→ Approx. 35,000	≤ Approx. 750,000

The information in this appendix was provided by the National Planning Data Corporation, Southern Region, 14679 Midway Road, Dallas, Texas 75244.

Related Publications

After the Factories, December 1985. **$7**
This seminal analysis of employment patterns in the rural South, published in December 1985, won widespread attention for pointing out a structural shift in the regional economy, both in its mix of industries and its pattern of business locations. Later analyses, including MDC Inc.'s *Shadows in the Sunbelt* and the Board's *Halfway Home and a Long Way to Go* (the report of the 1986 Commission on the Future of the South) drew heavily upon the findings first reported in *After the Factories*.

Factory Automation and Japanese Ownership in the Rural South: Two Case Studies, December 1987. **$7.50**
Part of a comprehensive study on the impact of automation on manufacturing in the rural South, this study examines how Japanese ownership affects ownership decisions and adaptation to new technologies in rural areas.

Reviving the Rural Factory: Automation and Work in the South, May 1988.
Volume I, *The Final Report* (**$27.50**); Volume II, *The Case Studies* (**$20.00**); Volumes I &II (**$40.00**); *Executive Summary* (one copy no charge, additional copies **$3.00** each).
Published in two volumes, this report presents the case that more effective and quicker diffusion of available technology to rural southern manufacturers is essential to the rural South's economic future.

Halfway Home and a Long Way to Go: The Report of the 1986 Commission on the Future of the South. **One to three copies, free of charge. Additional copies, one dollar each.**
Every six years, the Board assembles a **Commission on the Future of the South** to set forth a statement of regional objectives which will become a policy agenda for the region. The 1986 Commission issued one of the most highly acclaimed reports in the history of the region, *Halfway Home and a Long Way to Go*. In brief, eloquent terms, it lays out ten regional objectives which will form the broad agenda for the Board until 1992. The goal of the report is to improve the economic condition, educational opportunities, and quality of life for all Southerners by increasing their capacity for development from within. Committee reports and supporting documents of the 1986 Commission are three dollars each.

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